

# MANUFACTURERS' RECORD

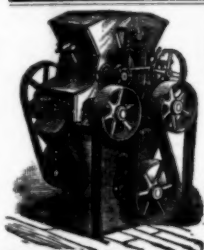
A Weekly Southern Industrial and Hardware Newspaper.

VOL. 9. No. 6.  
WEEKLY.

BALTIMORE, MARCH 20, 1886.

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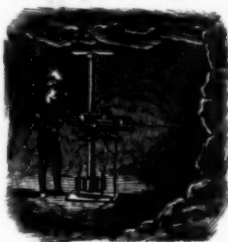


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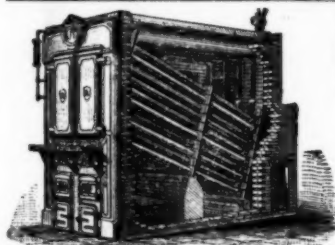
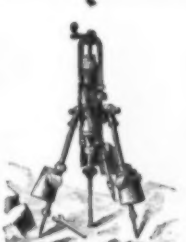
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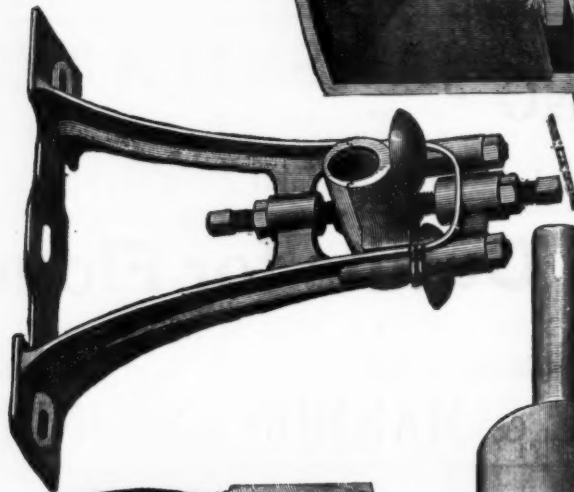
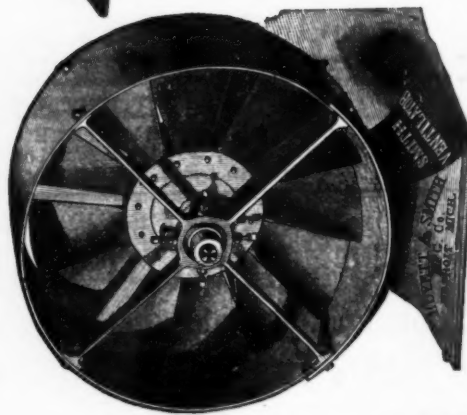
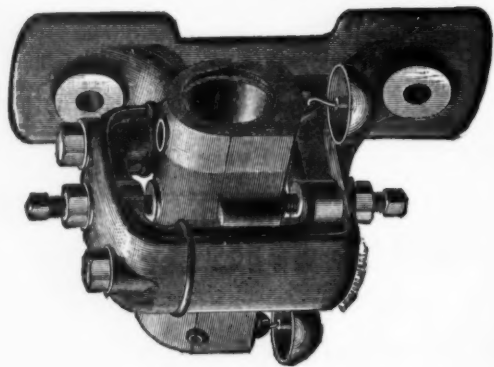
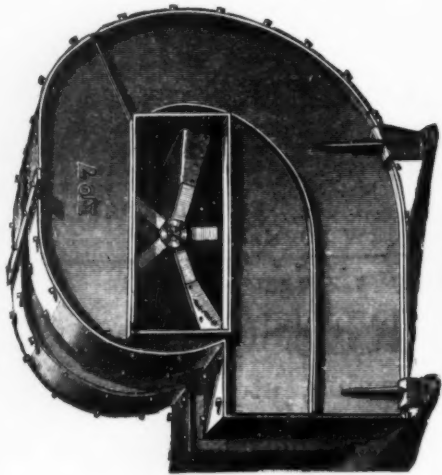
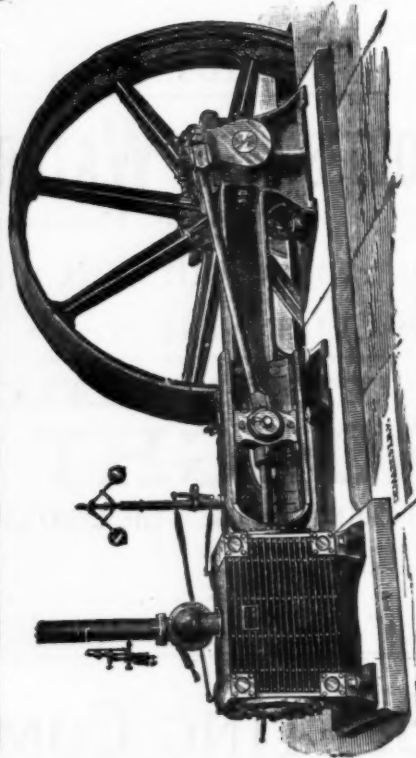
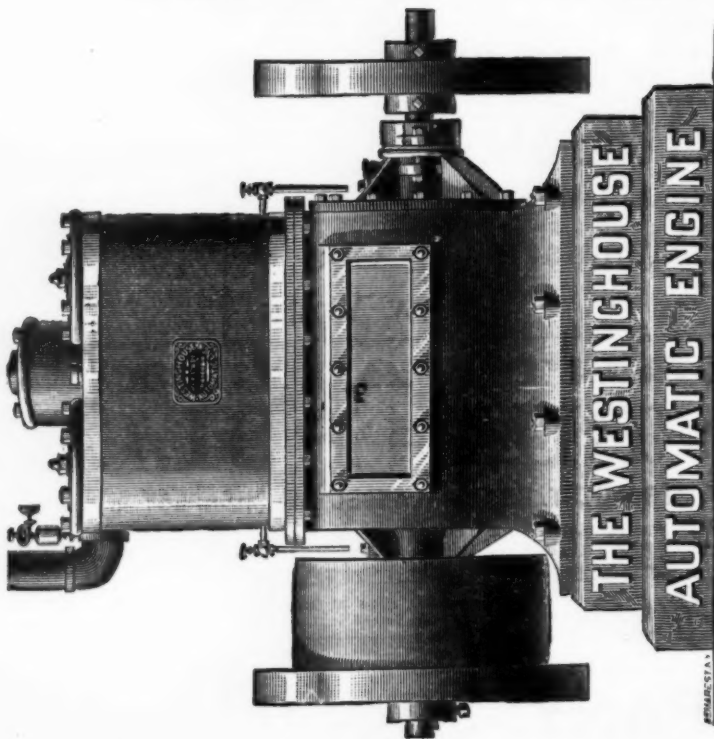
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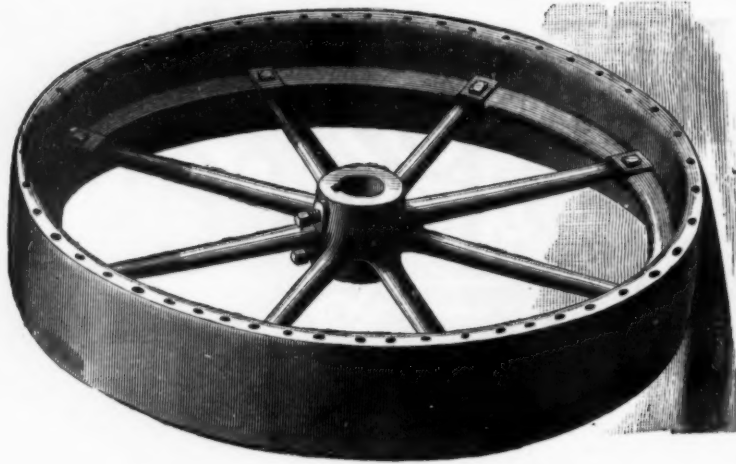
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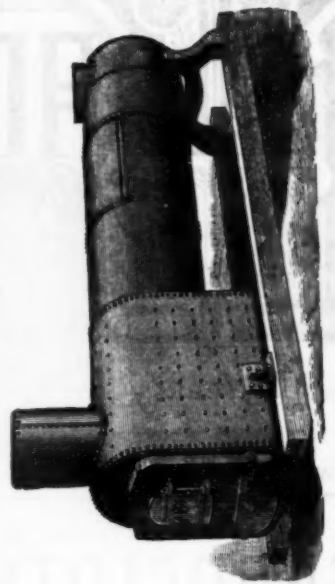
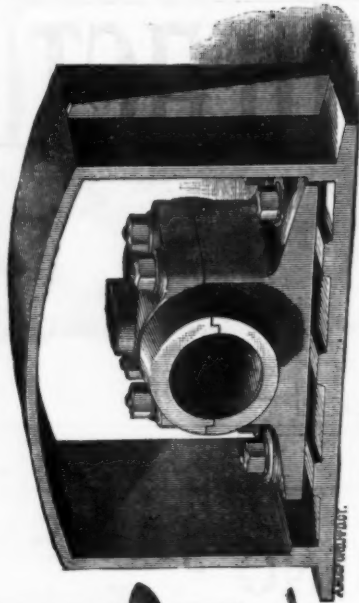
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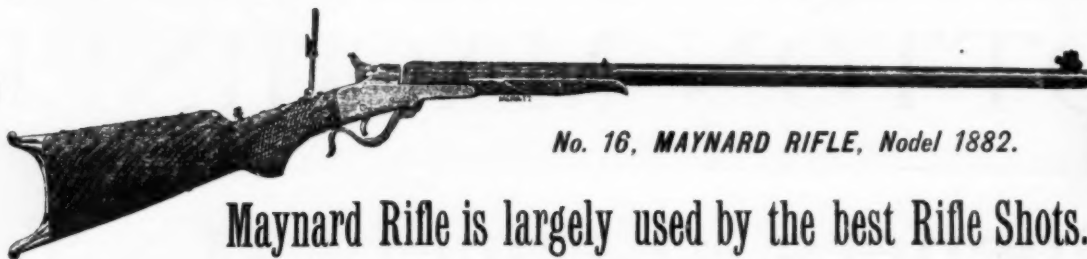
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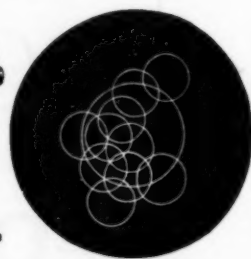
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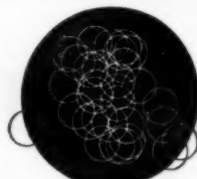
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On May 9, 1885, Mr. W. H. TAFT, of Brattleboro', Vt., made in a regular match, with a Maynard Rifle, at 200 yards distance, off-hand, 117 out of a possible 120, on the Massachusetts Paper Target, a score which has never been excelled.  
Inside of a ring  $3\frac{1}{4}$  inch diameter, Mr. C. H. BROWN, of Fitchburg, Mass., in a regular match at Walnut Hill Range, July 5th, 1884, at a distance of 200 yards, with a Maynard Rifle, placed 7 consecutive shots.

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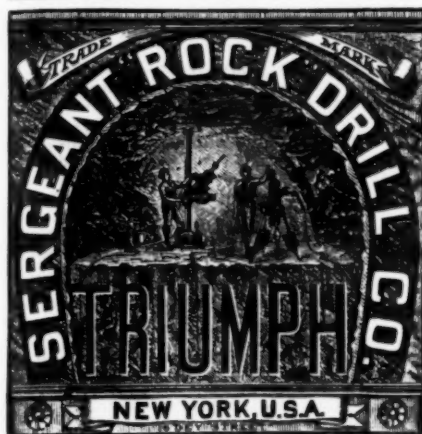
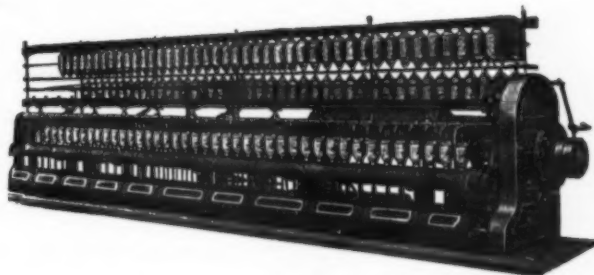
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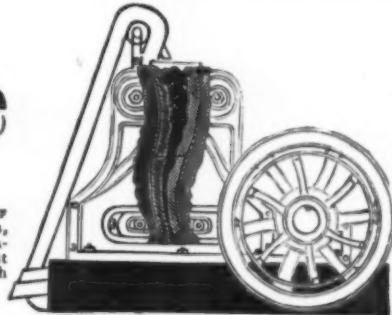
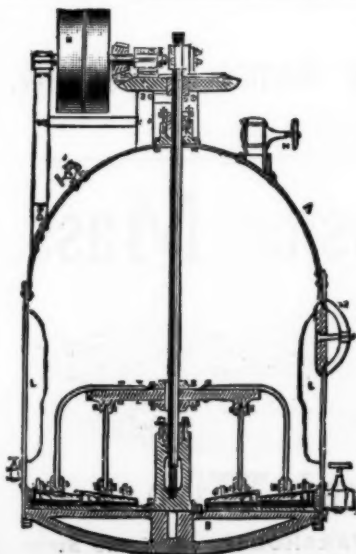
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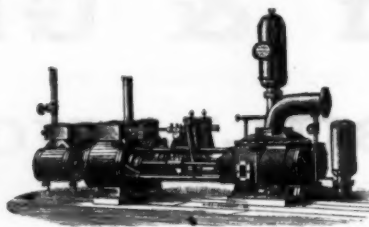
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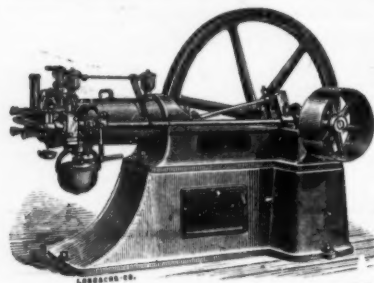
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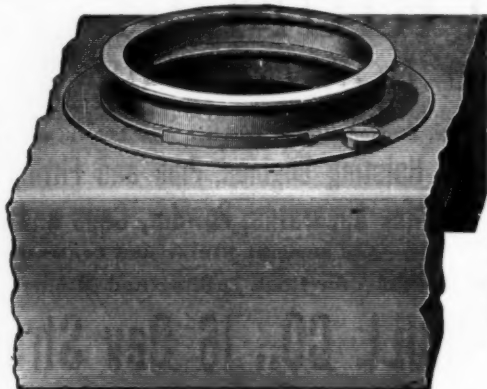
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1869...	6,025	
1870...	20,228	
1871...	38,648	
1872...	94,264	12
1873...	117,301	
1874...	168,382	500
1875...	223,924	963
1876...	285,319	947
1877...	270,811	946
1878...	215,214	3,309
1879...	336,918	8,007
1880...	567,860	11,264
1881...	659,730	5,974
1882...	636,715	22,515
1883...	416,500	21,689
1884...	310,869	25,105
1885, 9 mos.	212,056	22,373
Total number sold...	4,489,794	126,604
Total number in use 4,363,190.		

The great durability of our Rings is shown by the fact that we have more rings in use over twelve years old than all we have sold for repairs.

This statement shows unmistakably that a mill once supplied with our rings need think but little of the cost of repairs. As the number sold for repairs is an average of about twenty per cent. of the number sold the tenth year before, the average life of our rings will be at least twelve years.

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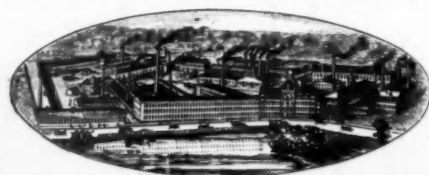
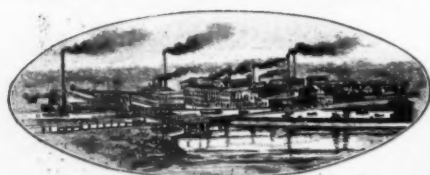
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Secretary and General Manager.

R. H. EDMONDS, EDITOR.

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BALTIMORE, MARCH 20, 1886.

## The Industrial Outlook at the South.

Rarely, if ever, before has the industrial outlook at the South been so promising as at present. The cotton mills and iron works are running on full time; many of them are really crowded with orders, and their business is yielding better profits than for several years, and of other lines of manufactures the same is true. In the diversification of manufacturing interests there is very notable progress. During the last two weeks we have reported in our Construction Department the organization of many new enterprises, and among some of the most important were a \$100,000 sugar refinery in Kissimmee, Fla., a \$50,000 fertilizer company in Ocala, an ice factory company in Sanford, broom factory at Tampa, a \$200,000 coal company at Mobile, Ala., a \$15,000 agricultural implement company in Rome, Ga., a tobacco factory and a \$50,000 company to manufacture pianos in Atlanta, an ice factory in Macon, a \$100,000 phosphate company at Brunswick; a \$20,000 gas company, a \$5,000,000 mining company and a \$50,000 lumber company in Arkansas; a \$300,000 wagon manufacturing company, a \$250,000 clock manufacturing company, a \$50,000 wool manufacturing company, \$45,000 stove works, \$1,500,000 natural gas company, a \$60,000 company to manufacture burglar alarms and electrical goods, and a stove foundry in Kentucky; in Louisiana the list of new enterprises for two weeks includes a \$150,000 ice factory, a \$60,000 cotton

compress and the prospect of a 5,000 spindle mill to manufacture ramie. North Carolina shows for the same period a \$50,000 company for the manufacture of coach material, some five or six new tobacco factories, a number of saw mills, mining enterprises and other industries, South Carolina a \$50,000 electric light company, while Tennessee reports a \$50,000 fruit-canning company, a \$50,000 natural gas company, a \$150,000 iron company, a shoe factory, \$25,000 range and castings company, a \$50,000 furniture manufacturing company, an ice factory, machine shop, a \$100,000 company to manufacture heating furnaces, a cheese factory, a marble company, gas light company, grain elevator, a flour mill company, a \$50,000 soap and chemical company, a hosiery mill company; in Texas there have been reported a \$25,000 ice company, a \$25,000 electric light company, \$30,000 cotton gin factory, \$50,000 gas works, \$50,000 lumber company, \$50,000 rolling mill, a \$250,000 cotton oil company to build a mill, \$20,000 coffee and spice mill, a \$100,000 roller mill, a \$24,000 electric light and power company, a \$30,000 milling company and a \$15,000 flour mill; in Virginia, a \$1,000,000 tin mining company, an earthenware factory, a canning factory, machine shop, woolen mill, \$100,000 paper mill company and a flour mill, and in West Virginia a \$100,000 oil and gas company, an agricultural implement company, etc. As this is a record for two weeks only, and includes simply the most important industries organized or incorporated during that period, it shows that there is much industrial activity all through the South. In addition to the enterprises mentioned there have been many saw and planing mills and small industries generally. And the indications are now favorable for some very extensive new enterprises. The Pittsburgh papers announce that Mr. Henri Hauman, a noted Belgian engineer, passed through that city last week on his way South, where he is going to locate a large iron and steel plant for a powerful Belgian syndicate. These works, it is stated, will employ over 1,200 men, and will manufacture steel by the basic process. And so the good work goes on. Day after day adds to the list of new enterprises and to the wealth of the South. Col. A. K. McClure, the editor of the Philadelphia Times, who is a good authority, says:

"I regard the prospects of the South as even much better than the Southern people themselves regard them. There is nothing in the history of the world that can be compared with the efforts of the Southern people to rehabilitate themselves. Considering the institutions under which they grew up, their system of labor which has been so violently revolutionized and the necessity for diversifying their industries, of which they knew little or nothing, it is marvellous how they have adapted themselves to the new order of things and to what a stage of advancement they have arrived in a few years. Pennsylvania has much more reason

to fear the South in the manufacture of iron and in the competition than any foreign country. You will draw a large portion of our industry to your section, and we, as we have always done, will learn something new and go at it. There cannot be anything more insane than the raising of cotton here in the South, where you have the benefit of splendid water power that never freezes and where everything tends to cheapen production, and then to ship that cotton away to bleak New England, and there to have it spun and woven. That system cannot last in the New South. Whenever capital comes South, where it is bound to come, there will be a revolution; and it cannot be far distant."

## An Expert's Opinion.

Mr. James P. Witherow, the well known furnace builder, of Pittsburgh, Pa., who has built quite a number of furnaces in the South, has again been making a visit to the iron centers of that section. In an interview with a reporter of the Birmingham Age, Mr. Witherow expressed himself as being greatly pleased with the improved furnace operations of that district. Many of the large furnaces he found doing much better work and turning out a heavier daily production of iron than heretofore. Of one of the furnaces, the workings of which for several months past he carefully examined, he said: "It is unsurpassed in any other district in this country in uniformity of out-put, in quality and in low fuel, thus at once lessening the cost and increasing the value of the out-put, all being No. 1 foundry iron." \* \* \* "I regard the ores of this district," said Mr. Witherow, "as easily smelted, and therefore not refractory, as has been assumed by many, and that when the furnace is burdened with, say, two of ore to one of coke, and the heat maintained, from 1,400 to 1,500 degrees, with intelligent management, there will be no trouble in your blast furnaces, and the practice will compare well with the most favored districts. Such results must be gratifying here to the iron masters and citizens generally, because it assures an increasing furnace development and of course, on that account, the continued progress and growth of your city."

Having developed a large iron industry, it is important now, Mr. Witherow thinks, for Birmingham to supplement this with steel and nail making. "Our recent developments at Pittsburgh," he said, "have practically demonstrated the fact that nails made of pig metal of from four to five-tenths of 1 per cent. of phosphorus ore are better than those made of pure Bessemer stock. This is because the Bessemer nail is too ductile, bends too easily in driving, and when carbon spiegle or ferro manganese is added to stiffen and harden the nail the head is more liable to be broken off. Whereas the severe tests that are made with the nails made by the other processes, will show that when driven into the knots of an oak plank the nail does not bend but will clinch on the other side, and the head, though subjected to the severest tortures, cannot be dislodged. The chief element of these excellent properties

in Clapp-Griffiths steel or nails is the elimination or carrying off of all the silicon in the process of the blow or of the cinder discharge, the intense oxidation in the early stages of the blow promoting this rapid de-silicization. The oxidation is invited by the small amount of iron in the beginning of the blow, while being poured, coming in contact with the great superficial volume of oxygen. Other causes developed in the chemical reactions can be adduced for the superior quality of our steel."

Arrangements have already been made for the erection of a steel plant and nail factory at Nashville, which, Mr. Witherow says, will be built this summer by a company composed of some of the wealthiest capitalists of that city. This will be a very important step forward in the advance of the South's industrial interests. Anniston and Birmingham people have been talking about building steel works, but it looks, from what Mr. Witherow says, as though Nashville will be the first in the field. The pig iron production of the South is increasing so rapidly, with the prospects favorable for the early building of half a dozen or more additional furnaces, that the need for steel works and diversified industries generally is becoming constantly of more importance to the continued healthy growth of the South's iron interests. It is to be hoped that the capitalists of other places will follow the example of Nashville, and that before long the South will be largely engaged in steel making and kindred enterprises.

In a review of the growth of the American pottery industry, Bradstreet's says:

"The establishment and development of the American pottery industry, as of many others, is due largely, if not entirely, to the high rates of duty placed on foreign ware by the Morrill tariff and to the later increases in the same. Prior to the war this industry was hardly worthy the name, being confined to the manufacture mainly of jugs, crocks and yellow-ware. To-day, as reported by the United States Potters' Association on January 13, there are about 275 kilns in operation in this country, not including those employed by decorated pottery makers, of which there is a large number. The total capital employed in the industry is about \$8,000,000, two-thirds of which is absorbed in plant. The amount of wages paid to the thousands of pottery employees per annum is placed at from \$4,000,000 to \$5,000,000. The annual value of the American pottery product is about \$8,000,000, or about one-half of the total value of that consumed in the home market. \* \* \* Home competition has tended to reduce the price of pottery-ware, notwithstanding the high tariff."

For once a free trade paper has admitted that home competition, due to the development of an industry by protection, has reduced the price of any article.

An attractive circular setting forth the advantages of Mossy Creek and Morristown, two small towns in East Tennessee, has been issued and can be had of Mr. W. H. Coffman, Morristown.



### Our Birmingham Letter.

#### Continued Business Activity—Birmingham Coke—The South and the Internal Revenue System.

[Special correspondence MANUFACTURERS' RECORD.]  
BIRMINGHAM, ALA., March 15, 1886.

The dead level of the local industrial situation still continues. Pig iron stocks are accumulating slowly, if at all, and prices are maintained. Movements of the product are about as active as during the previous weeks, but are now principally confined to shipments East, the Ohio river pool rates tending to shut us out of Cincinnati and Chicago. Quotations at furnace are: No. 1 foundry, \$15.50@16.00; No. 2 ditto, \$14.25@14.50; No. 3, \$13.75; Grey Forge, \$12.25. In general iron lines business could hardly be better. The rolling mills are just as busy as ever, the bridge works are rushing their early orders, and pipe works, foundries and machine shops are full of activity. I have delayed writing this letter for a day, in the hope that some developments of a most important character would lick themselves into legitimate shape for report. A nest of industrial roe's eggs of the largest size are hatching and will create a sensation before long. I am not yet at liberty to mention names or details, but the plans, already far advanced, will include the early erection of several large furnaces in connection with other manufacturing enterprises, and coincidentally with important railway movements.

Among the promising things of the week is the evidence that the good offices of the MANUFACTURERS' RECORD have created a live interest in Birmingham on the part of the capitalists and manufacturers of Baltimore. There is a prospect that your city will furnish the means and management for extensive stove works in Birmingham. I am told that negotiations are under way looking to that end. Perhaps it is well to mention in this connection that enterprises of any sort calculated to consume our pig iron "on the premises" will receive the utmost encouragement. Anything like the one just mentioned could probably be furnished with valuable property sufficient for all purposes, free of cost. Readers of the MANUFACTURERS' RECORD understand, of course, that the Birmingham correspondent of the same is quite at their service in respect of information, which will be cheerfully furnished on application.

I have referred hitherto to the excellent coke manufactured by the Watts Coal & Coke Co., the stock of which is largely held in Baltimore. The intention of the company to erect a large number of coke ovens this season has been also announced in your columns. During the week I had the pleasure of shewing samples of this coke to a leading Eastern iron maker, who is here intending to join in the development of this district. After a careful examination of the Watts coke, he assured me that it was far better than anything he had believed possible to this vicinity, and admitted that, to all appearance, it was identical with Connellsville. Professor Colton has been here on a visit recently, and I think has modified his former opinions as to the character and possibilities of Birmingham coke very materially. The introduction of the Watts product, and the late recognition of Professor Procter's work in the Elkhorn coking coal field of Eastern Kentucky, has done a great deal to dispel the old illusion that Connellsville stood alone in the world as a possible producer of unexceptionable coke. Considerable as have been the developments in this district, it may safely be said that the surface has been scarcely scratched as yet. There are many promising coals that have yet to be practically tested as to their coking qualities, and others that have been tested, but await transportation facilities. The Gould seam is one, and there is another of

value over in the Coosa field. It is not claiming too much to assert the probability that Connellsville will have formidable rivals in this district within a year or so. I have heard it stated by an expert that the Watts was demonstrably a better foundry coke than standard Connellsville.

The stream of visitors, nearly all of whom belong to the classes of capitalists or manufacturers, continues to flow to this city. The New York people interested in the Georgia Pacific were here last week, besides a number of gentlemen connected with an English and Eastern syndicate which is preparing for operations on a heavy scale, it is said in conjunction with Mr. Henry F. de Bardeleben. All the professional prospectors, examiners and analysts in town are busy and in great request. The mineral holdings of the railways are being looked up assiduously, and the general demand for coal and iron property continues not only active but feverish. Iron property remote from this point is coming rapidly into notice, in view of the growing scarcity of the same near by. One hundred dollars an acre is not regarded as an extravagant price to ask for good Red Mountain iron land near Birmingham, and ten, or, at the farthest, fifteen years ago the same was probably worth about 12½ cents.

Work has commenced on the new union railway station. There is nothing new in regard to the furnaces now being built. City real estate is active and still rising, although not fast enough to suggest "booming." Public improvements are prosecuted energetically. Grading and paving have kept about half the town torn up for the past year, but the results make it a much more comfortable place to live in, or to ride or drive on. Ground is being broken for a number of business buildings and residences. Far from any abatement of the activity with which the season opened, it is evidently increasing daily.

The general sentiment of the industrial South on the subject of the Morrison bill has been very neatly stated by the Philadelphia Press: "Col. Morrison's happy facility for so constructing a tariff bill as to unite the Protectionists and divide the Free-traders was never more beautifully illustrated than it is by his present measure. We speak feelingly in expressing the hope that we may have Col. Morrison with us for many, many years." To people in these parts it looks as if all danger from the Morrison bill had passed, and, as I have expressed it before, I am very sorry that the feeling is as comfortable on this score as it appears to be. The bill may find an unhonored grave in the Congressional ash-heap, and its author may speedily pass into the political oblivion he has so laboriously earned, but the free-trade worm still gnaws, and the whisky monopolists of Peoria, Chicago, Cincinnati and all Blue-grassdom are yet in the ring and quite ready for another tussle with the friends and champions of American industry and labor. British manufacturers are not unmindful that their fund of an hundred thousand sterling or so—for the dissemination of "tariff information" in the United States—has been productive of many conversions to the ultra free-trade view of the question; and there is a bold, fearless and patriotic lobby in Washington determined never to give up the fight as long as the British and whisky interests are willing to furnish the necessary "arguments and literature." The ghost may be laid for a time, but it is one that will never stay dead until that which makes its materialization possible is annihilated! Last year the internal revenue receipts were not far from enough to cover the surplus of receipts over expenditures of the government. They are increasing, and that fact lends added danger to the situation of native industry.

The press despatches from Nashville give the details of a most brilliant raid of government detectives on the poor mountain farmers of several Tennessee counties. A regular military expedition was sent out, and during the campaign a large number of prisoners was captured, and scores of stills and thousands of gallons of spirits destroyed. The reports, as usual, state that the growth of private distilling in the country had begun to interfere with the profits of "legitimate" dealers, who, being in partnership with the government, must be protected! What a commentary this is upon the alleged freedom of our institutions! These poor mountain people cannot market their grain or fruit and realize the least profit on their toil unless allowed to turn a part of their crops at least into liquor. How long will the people of the South give their support to this vile system of taxation and persecution, that not only robs the poor of their equal chance to place their products in the best shape to secure a market, but which in doing so draws from the people a vast fund for the purpose of corruptly attacking all legitimate native industries? I am convinced that the organized labor elements of the United States, whose strength and political influence no one can now deny, will before long take this side of the tariff question into consideration. Their interest in the perpetuity of protected industrial labor will never be quite safe while the whisky monopoly has the means to keep the agitation going against the principle of Protection.

It is stated, and I hope with truth, that the labor unions of the country are preparing a petition to be presented to the Congress, calling upon that body to maintain the present customs tariff. It is also said that resolutions will accompany the petition, intimating that the political future of all free trade or tariff revision Congressmen will be a matter of the greatest interest to the laboring men of America. Action like that ought to produce as much effect in one direction, as lobbies, money and general corruption were depended upon to accomplish in another. But the workingmen ought never to halt until they have made it plain that the internal revenue system is regarded as a foe to Protection, and hence to native labor! It is not an American system; in its methods it is rather Chinese. As such it must go!

G. B. WEST.

SOUTHERN cotton mills are prosperous. Southern iron furnaces are also doing well. In fact the New South seems to be in full blast, as it were, and the sentiment favorable to the protective policy goes on spreading. Free trade leaders have gained information concerning this section lately which chills them to the bone. They have been in the habit of counting the South as solid for a low tariff; and here come reports from Alabama, Virginia, South Carolina and Tennessee, that "a powerful movement is on foot for a Southern convention in favor of permitting the tariff to remain as it is." This from the "provinces" that free traders have counted upon as ready to stand against the tariff through thick and thin, is well calculated to raise gooseflesh on the doctrinaires.—Nashville Artisan.

The MANUFACTURERS' RECORD wants to see this tariff convention held. It was the first paper to suggest it, and it invites the co-operation of every paper in the South that favors a protective tariff. The South needs the convention and it ought to be held at once.

The monthly journal "Clay" has taken the much better name of the Brick, Tile and Pottery Gazette, and now appears in handsome shape.

### Skilled Labor in the South.

As long as the Southern people were devoted to agriculture as the one industrial pursuit overshadowing and engrossing every other, and especially as long as agriculture was pursued very much as it had been pursued for a century or more, there was no such necessity for skilled labor in the South as to stimulate the inventive talent of her people, or to direct their attention to the peculiar practical education essential to an equipment of men for artistic work in the every-day industries of life. But things are changed now. The new South is a very different land from the old South. The Southern people are becoming manufacturers as well as agriculturists. And the farmer himself is brought at last to a recognition of the advantages of the many improved implements and engines devised for the facilitation of husbandry, in the regulation of its energies, in the expansion of its enterprise, in the variation of its objects, and in the adjustment of its economies. Hence it is that in the South not less than in the North there is an intelligent, appreciative and earnest demand for skilled labor in every branch of business and department of trade.

The schools of the South, the primary schools, the academies, the colleges, should all be given a very decided and positive trend in the direction of skilled labor; for there is no other country in the world offering on every hand greater promise of reward for it than these same old slave States of other days, with their lethargy now shaken off, with their vast and varied resources catching the eyes of capitalists all over the world, and with the aspirations and energies of their people diverted in new directions looking and leading to more robust and enduring results. Mind and muscle can and will go hand in hand in the South, as naturally and as easily as anywhere else on the habitable globe. In the nature of things agriculture must always be the supreme factor in Southern industries and economies; agriculture is essentially associated with manual labor; and the white man as well as the black man, the owner as well as the renter of the land, in the South, must "hoe his own row" henceforward. Thus we have the workingman as the capitalist and the capitalist as the workingman—the man developing his muscle and the man developing his mind combined in one. And as it is, necessarily, in agriculture, so must it be, in more or less degree, in other things in the South under the new systems evolved from the changed conditions of affairs inevitably following the revolution wrought on every hand by the war. Nowhere in the civilized world is there more room for work, more need for work, more reward awaiting work than there is in these Southern States, with their mineral riches undeveloped, with their manufacturing capacities unformulated and unemployed, with their great forests unutilized, with all the dormant wealth of all their lands and all their waters that is but waiting for the wand of the workman to call into activity the varied values it involves. Nowhere is there a broader, fairer field for the harmonious cooperation of the kindred interests and the kindred agencies of capital and labor. Nowhere is there bigger or brighter opportunity for the man of energy and enterprise, either with money or without it. In the North colossal fortunes are by no means phenomenal; in the South the reverse of this fact obtains. There the inequalities of individual possessions are a striking feature of society. Here it is not so. Hence it is that in the Southern much more than in the Northern States of this Union the vexatious problem involving the rightful relations between what is commonly called capital on the one side, and what is commonly called labor on the other side, may be considered simplified for satisfactory solution through the equitable agency of a general industrial system working out its logical results according to the normal prin-



ciples of justice and truth that, in an enlightened age, and especially in a free country, like this, wisdom would lay down as the basis for the most healthful of all social organizations. In the North the accumulated capital of each and all the generations since the settlement of this country by the white man is still there. The besom of war swept away all or almost all corresponding accumulations in the South, only a little more than two decades ago. There the race for riches is an unequal race, between the strong man with fortune and the weak man without it. Here the race is a more equal race, between the man of energy, and economy, and endurance, on the one hand, and the man wanting in these attributes of success, on the other—both on their natural mettle and neither with extraordinary advantages to aid him.

In all the aspects of labor, whether with mind or with muscle, the South presents the broadest and the fairest field for it. And skilled labor, which is in itself the best of capital, will at no distant day be found more in demand, more profitable, and, if you please, more fashionable among the manliest men of these Southern States than among any other people of all this great American land of ours.—Industrial South.

### The Tariff.

In reply to the argument so much harped on by free traders—that the duty on the protected articles comes from the pockets of the consumers—we will favor them with some modern English views on the subject, as some of the able contributors to the Virginia Farm and Home object so much to the ancient ideas, and will learn nothing from the past dead, but favor the living present. This is just into our hands, for protection will apply everywhere and every way—to the past, present and future—to the right, left, front and rear; whereas free trade has neither height nor depth, and its influence for evil is incalculable and its ways are past finding out. You may handle it as you will, and you will (to use a vulgar phrase) "get your foot in it;" and this would not be so bad, if you would not get the other foot in, too. With both feet in the mire, you are apt to stick fast; and if perchance you get out, your tracks are left behind you, as a warning to others not to follow.

Robert P. Porter, writing from England to an American journal, describing the industrial condition of Great Britain, in a letter from Bradford, the center of the great worsted industry, says: "If I were asked what the keen Bradford manufacturer thought on economic questions, I should frankly reply that, after an experience of a generation, some of them are prepared to prove that tariff duties come more largely out of the producer than the consumer. Some of them demonstrated this quite conclusively to me. One of the most prominent said: 'The truth is, the higher the foreign tariff, the lower we must make our goods, and the less we can afford to pay labor. The least possible reduction in the United States tariff will be a grand thing for Bradford; but how it will affect your industries, I can hardly say. We are obliged to sell our goods in France for the same price as we did before they enacted the higher tariff, and the Bradford manufacturer is paying that duty—not the French consumers of the goods. I know from practical experience what I am talking about.'"

Now we have given you some modern English testimony. In our last letter we gave you American testimony—so conclusive that it has not been even attacked by the free traders—that the tariff does not regulate the price to the consumer. We will now bring to your notice one that applies directly to the English Cobden Club, and one which ought to convince any one, if he is a loyal citizen of the United States, and connects himself with this philanthropic (?) organization in England, that he has mistaken his flag

when he looks upon the American eagle for that of the British lion. You cannot serve two masters, is divine law. Which will you cleave to, the Star Spangled banner or the British crown?

In 1883, February 1st, Dexter A. Hawkins, of New York, spoke as follows: "Some years ago I attended, by invitation, the monthly meeting of the hardware trade of Sheffield, England. Their exports then were chiefly to this country. An eminent manufacturer, in addressing the meeting, inveighed with great bitterness against the American tariff. He said he had examined the question with great care, and such examination demonstrated that the English manufacturer was paying at least one half of the tariff on all the goods he exports to America; and they must break down our tariff, at whatever cost, or it would build up American rivals, to the extent, at least, of supplying our home market, and then England would have to pay the whole tariff, or lose the market; and when that point was reached, she would have to compete with the American manufacturer in every foreign market, then her own almost exclusively.

Another English manufacturer a few years ago (please note this down) while lobbying at Washington against our tariff, confessed to a free trade Congressman that the protective duties, in the long run, came almost wholly out of the foreign producer; that if they only came out of the domestic consumer, the foreign manufacturer would not care a button about our tariff laws."



THE QUAKER BRICK MACHINE.

These statements are unassailable, because the facts are every day before us, and we know—all alike know them to be true; and yet we have men here who are doing all in their power, for what purpose we know not, to throw a veil over them—to hide them from public view. Some of these people, too, have been trying to ridicule us out of our course, but to no avail, by pretending that we stood alone in this discussion; but we tell them now that we do not feel at all lonesome, and should you bring it to the test at the ballot-box to-day, and every one would cast his ballot according to his views, ignoring all other issues and party nominalism, our country would go two to one in favor of Protection. We are truly glad the question is agitated now, and hope it will be kept up prominently before the people, and turn all the light on it that both foreign and home Free Traders can call into action. We shall look forward with a great deal of interest as to the result, especially in Virginia and all the South. Look at those elegant journals, The Industrial South, published in Richmond, and The MANUFACTURERS' RECORD, of Baltimore, of which we noticed in the last Virginia Farm and Home a good account. Those figures were unwelcome statistics to the opponents of our grand South. They speak of Massachusetts manufacturers as brethren, not as aliens to be despised. How un-American this sectional clan treat their brethren, because they happen to live in

another State, and hug to their bosoms the foreigner who has no earthly interest in our welfare. We repeat it: Shall the end to this influence never come?

We have from The MANUFACTURERS' RECORD, Baltimore, these highly interesting facts: "That the South is now producing at the rate of \$300,700,000 more of agricultural, manufacturing, and mining products a year than in 1880, and is steadily increasing even these stupendous figures. Some idea of the magnitude of this increase may be gained from the fact that it is a little more than the average value of the entire cotton crop, and \$25,000,000 greater than the total value of the wheat crop in 1885."

We will now make a comparison of how manufactures affect the value of lands, taken from the Census Reports of 1880. Virginia is a great State, in advance of Pennsylvania in settlement, and for a long period in population. It is rich in agricultural resources, in coal and iron, water power, wood and timber. So is Pennsylvania. The former is essentially an agricultural State, though destined to become great in mining and manufacturing. It had in 1880, according to the census, 51.41 per cent. of the people in agricultural occupations. The average value of her farm land was \$10.89 per acre. Pennsylvania had but 20.68 per cent. of her workers employed in agriculture, and her farm lands were worth \$49.30 per acre. About the same results we get by comparing other States of equal advantages, and attributable to the same causes. I will conclude this letter by noting the views of the Hon.

want to invest too much in a machine, but can not make by hand and compete with machine bricks.

One shoveler will feed the machine when running up to 12,000 per day, but beyond that it will require two men, as it should be kept filled clear up to the sweep to obtain the best results; also one sander, one striker, and two or three off-bearers, according to distance to drying ground.

The following are some special features in the Quaker machine:

The clay falls vertically into the press-box through an opening in the front side of the machine floor ten inches wide, and as long as the machine is wide, filling all parts of it equally.

The pressure is applied horizontally instead of vertically, driving the clay against an inclined wall at the front of the machine, by which it is directed downward into the molds directly underneath. By this method the end bricks are pressed as much and no more than the center ones, are made of uniform density, and when burned the shrinkage is the same.

The amount of pressure upon the clay can be changed instantly from none at all to a great deal, to correspond with the consistency of the clay, by simply drawing out or pushing in the rod B.

By applying the pressure horizontally, the trap-doors shown in front of the machines can be used. These doors are held in place by strong steel springs, and so adjusted that if a stone or other obstruction presents itself in any single mold, the door flies up and allows it to pass out, leaving the remaining five bricks perfect. They require no attention, and the breaking of the machine or mold by a stone is said to be scarcely possible.

The difficulty in getting the bricks out of the molds after being filled is overcome in the Quaker machine by the peculiar construction of the die. The fingers of the die set squarely over the partitions of the mold, the space through which the mud passes being 1½ inches narrower than the brick itself; the mud is forced to the bottom of the mold, out and up, filling it on the same principle that a moulder does when working by hand, leaving the sand without being wiped from the sides, thus enabling the brick to slip freely when dumped.

There are two sizes of steam machines made—one called the regular, and one the extra heavy. Both steam and horse-powers are the same in width, each making six bricks to the mold.

The machine is so geared that the main cog-wheel passes around once to each mold of brick pushed out. If the machine is driven to make 2,880 per hour, or 8 molds per minute, the pulley on machines should make 128 revolutions per minute. It is 24 inches in diameter and has an 8-inch face.

These machines are manufactured by Fletcher & Thomas, Indianapolis, Ind., who also make a pug mill which can be attached to any brick machine.

In Kansas City, nine of these pug mills attached to five different kinds of brick machines are making a net cash saving of \$4.00 to \$7.00 per day each. This concern contracts to furnish the Improved Quaker Brick Machines, pug mills, engines, boilers, mold sanding machines and everything complete. Their catalogue will be mailed upon application.

MESSRS. WILLIAM J. HOOPER & SON, of this city, are building an addition to their dry house, at Mountain Island Mills, N. C. This increased capacity is demanded by the high standing already attained by their plaids, which command a higher price, it is said, than any other made in the South.

PHILADELPHIA seems to be given a large share of her warp and yarn orders to the South. The idea heretofore prevailing that the product of that section was inferior to Northern make is dying out.

Secretary of the Treasury, Mr. Manning, who says we are confronted with the fact that we must derive from impost duties \$150,000,000 annually for revenue. All the objection we have to this view is that he makes the revenue of primary importance, whereas we would make Protection paramount to revenue. Take care of the people, and the people will take care of the revenue.—Correspondence of the Virginia Farm and Home.

### Machinery for Making Brick.

In the rapidly developing new South there is a growing demand for good brick, and new brick-yards are almost daily adding to the number of new industrial projects started. To make a perfect brick, a manufacturer should have the best machines and pug mills.

The Improved Quaker Brick Machine, shown in illustration, is one that has stood the test of experience, and possesses many superior features, chief among which is its extreme simplicity. Any one can readily comprehend its working parts and learn to handle it without trouble.

It is built for service in any kind of clay that is fit to make brick from, without the liability of being broken. The working parts are all iron. The horse-power machine is 6 feet high, 5½ feet long at the bottom, and 3½ feet wide. Weight, about 2,300 pounds.

This machine is intended to meet the want of owners of small yards, who do not



# CONSTRUCTION DEPARTMENT

**WE PUBLISH, every week, a list of every new factory, of whatever kind, projected anywhere in the South; every railroad undertaken, and every mining company organized. This information is always fresh, and, by enabling manufacturers to correspond with the projectors of such enterprises before their supplies of machinery have been purchased, is of great value. Manufacturers will find it to their interest to read this department carefully each week.**

## ALABAMA.

A \$16,000 building will be erected at Montgomery, Ala., for Hale, Kraus & Co.

Louis Mounnin and Patrick Houston have been awarded the contract for erecting a building at Mobile, Ala., for Cunningham & Co., at \$15,500.

The Thompson-Houston Electric Light Co. have received the contract to light Selma, Ala.

The Montgomery & Florida Railway Co. has been chartered by M. P. Le Grand, J. R. Warren, H. C. Moses, J. A. Farley and others.

A new corn mill has been put in at the Athens Planing Mills, Athens, Ala.

The furnace of the Gadsden Iron Co., Gadsden, Ala., is being repaired, and will blow in about April 1.

Machinery has been purchased to be erected at the Stringfellow Plumbago Mine, near Ashland, Ala.

## ARKANSAS.

Mr. Stoffel is rebuilding his stave factory near Moark, Ark., previously reported as burned.

## FLORIDA.

A saw mill has been purchased and will be erected 1 mile from Kissimmee, Fla., by Mr. Bell and William Curry.

The Florida Southern Railway Co. will spend about \$100,000 in erecting new buildings and wharves at Palatka, Fla.

It is said that John F. Dunn, M. D. Burnet, of Ocala, Fla., and others will establish a fertilizer factory.

F. E. Alleyne and R. H. P. Drought are erecting a furniture and carriage factory at Kissimmee, Fla.

The Wekiva Spring, Bronson & Northwestern Railway Co. has been organized in Florida.

The Jacksonville, Tampa & Key West Railroad, previously reported as having purchased ground at Palatka, Fla., on which to erect shops, have commenced work. The machine shop and car shop will each be 60x120 feet. T. T. Wetmore is superintending the work.

## GEORGIA.

The Macon Oil & Fertilizer Co., Macon, Ga., will erect a one-story frame factory at a cost of \$2,000.

The Mutual Gas Light Co., Augusta, Ga., previously reported as to be chartered, will have a capital stock of \$200,000, and will build works as soon as their charter is obtained.

Devaul & Roberts have completed their new steam saw mill near Nashville, Ga.

Shanker & Slaughter will erect a stamp mill at their gold mine in Clay county, Ga.

A \$50,000 stock company will be organized at Atlanta, Ga., by W. W. Austell, J. F. Burke and others to manufacture the Cooper piano.

## KENTUCKY.

Messrs. Atherson, Harvey & Kebblers have leased a factory building at Greenup, Ky., and will start a stove foundry.

Meyer & Reidlin are building an addition to their brewery at Covington, Ky.

The National Manufacturing Co., reported last week as incorporated at Louisville, Ky., to manufacture burglar alarms, has a capital stock of \$60,000.

Bills have been introduced in the Kentucky legislature incorporating the Lexington, Nicholasville & Whitesburg Railroad Co., the Frankfort, Bellepoint & Leetown Street Railway Co., the Falls City Street Railway Co., with A. Strauss, M. Schwartz and M. Muldoon as incorporators, and the Madison & Southern Railway Co.

C. Stafford, B. J. Clay, A. R. Burnam and C. D. Chenault have formed, at Ford, Ky., the Ford Lumber Co. The planing mill, previously reported as being erected by Wm. J. Benners & Sons, has been purchased, and a large amount of new machinery will be added.

The Louisville Natural Gas & Heating Co. has been incorporated at Louisville, Ky., by R. A. Robinson, John F. Moore, Charles Bremaker, George W. Hicks, S. L. Avery, and others, to develop and utilize petroleum and natural gas. The capital stock is to be \$1,500,000.

## MARYLAND.

Water works will probably be erected at Union Bridge, Md., by the city and the Western Maryland Railroad.

Dambmann Bros., Baltimore, have recently put in at their works, a new engine and boilers, and a Sturvetant mill to pulverize phosphate rock.

The Edison Electric Co. are negotiating for the erection of a plant at Frederick, Md.

L. Finley Wright will soon erect a machine shop at Preston, Md.

## MISSISSIPPI.

W. F. Adams will add a two-story machine shop to his iron works at Corinth, Miss.

H. W. Foote, S. V. D. Hill and William King will erect a creamery at Macon, Miss. The machinery has been ordered.

W. D. Pugh and W. F. Crane are negotiating for machinery for a 6-ton ice factory which they will erect at Yazoo, Miss. About \$15,000 will be invested in the factory.

Bills have been introduced in the Mississippi legislature to incorporate the Hill City Street Railroad Co., and the Vicksburg, Yazoo, Delta & Northwestern Railway Co.

## NORTH CAROLINA.

L. Banks Holt, Graham, N. C., has purchased the Sidney Cotton Mills of Scott, Donnell & Scott, and will add from 90 to 100 looms.

The address of Hilton & Erwin, reported last week as to start a cotton factory in North Carolina, is Charlotte.

W. H. Hicks has started a brick yard at Durham, N. C.

B. Ludwick, Salisbury, N. C., has erected a new mill.

W. L. Hudson & Co. have built a plow and wagon factory at Siler Station, N. C.

Messrs. Burgess, Franklinville, N. C., contemplate erecting a saw mill at Staley, N. C.

The Tuckaseegee Lumber & Manufacturing Co., capital stock \$40,000, has, it is stated, been organized in Swain county, N. C., and are now purchasing machinery for their works, which will be located on the Nantahala river, 12 miles from Charleston.

P. W. Sigmon is erecting a distillery near Jacobs Fork, N. C.

The Cedar Falls Manufacturing Co., Cedar Falls, N. C., will put additional machinery in their cotton factory.

## SOUTH CAROLINA.

A \$50,000 electric light company has been chartered at Charleston, S. C. A plant will be erected at once, using the Thompson-Houston system.

## TENNESSEE.

The capital stock of the Scates Warm Air Furnace & Manufacturing Company, reported last week as incorporated at Nashville, Tenn., is \$100,000.

Robert Dyas, T. B. Dallas, H. W. Grantland, J. P. Ramage, Henry Sperry and others, Nashville, Tenn., have incorporated the Hermitage Hosiery Mill.

Thomas H. Cheek, Albert Eakin and James D. Buttolph will build the grain elevator at Chattanooga, Tenn., reported last week. It will have a capacity of 50,000 bushels.

L. H. Lanier, George A. Dazey and W. T. Cartwright have incorporated at Memphis, Tenn., the Memphis Mill Co.

It is stated that the Lookout Water Co., Chattanooga, Tenn., will make extensive improvements at their works, including the putting in of a large new pump.

The furnace of the La Grange Iron Co., Stribling, Tenn., is being repaired and relined.

J. R. D. Williams is purchasing machinery for a saw mill which he will erect at Pulaski, Tenn.

J. A. Gillespie and W. K. Mitchell have chartered at Chattanooga, Tenn., the Chattanooga Building Material Co., to develop the limestone quarry near that city, and operate the machinery for crushing sandstone, reported last week.

Perry & Whittington will erect a lime kiln near Winchester, Tenn., with a daily capacity of 125 bushels.

T. Calloway, Concord, Tenn., will open a marble quarry at Loudon.

Williams & Watson, Pulaski, Tenn., will soon add a saw mill to their planing mill.

G. E. Bennie & Co. have completed their new bucket factory at Thompson's Station, Tenn., and have it in operation.

It is reported that a stock company has been formed at Knoxville, Tenn., to start a brass and iron foundry.

R. F. Wallis & Co., Bellbuckle, Tenn., are preparing to build a new and larger plow factory, it is reported.

J. R. Norton, Ironton, Ohio, contemplates erecting an agricultural implement factory at some point in East Tennessee.

M. J. Palmer, previously reported as contemplating starting a soap factory at Chattanooga, Tenn., has, with John W. Hoagland, Hugh R. Banks, Thomas D. Scott, W. J. Carter and others, incorporated the Palmer Soap & Chemical Co., capital stock \$50,000, to build such a factory.

## TEXAS.

A stock company is being organized at Paris, Texas, to erect a \$90,000 ginny.

The Denison Electric Light & Power Company, capital stock \$24,000, has been chartered at Denison, Texas, by J. B. McDougall, W. B. Munson, J. T. Munson and J. H. Andrews.

The Terrell Milling Company, capital stock \$30,000, has been incorporated at Terrell, Texas, by A. J. Childress, T. M. Kell and E. J. Lockhead.

The Fort Worth Compress Co., Fort Worth, Texas, will move their compress to another site, and build a large warehouse.

Conrad Huberich, Paul Huberich and H. Bennighaus have chartered at San Antonio, Texas, the Huberich Coffee & Spice Mills, capital stock \$20,000. This is the company reported last week as the San Antonio Spice & Coffee Mills Manufacturing Co.

H. A. Fitzhugh, A. W. McComas, J. H. Fitzhugh and W. H. Tobin have incorporated at Austin, Texas, the McComas & Fitzhugh Fan Co., capital stock \$50,000.

The Texas Standard Cotton Oil Co., capital stock \$250,000, reported last week as incorporated at Galveston, Texas, will erect an oil mill.

The mill of the Montague County Alliance Milling Co., previously reported to be erected, will be built at Montague, Texas. It will cost \$15,000.

Mr. Douglas, Boxvie, Texas, will put new roller-process machinery in his flour mill.

Fischback & Co., of Tell City, Ind., have purchased the machinery of the furniture factory at Hawesville, Ky., and will move it to some point in Texas.

J. C. Mansfield, Athens, Tenn., is corresponding with citizens of Honey Grove, Tex., with a view to the erection of a flour mill at that place.

J. F. McNeil, Waco, has received the contract for erecting a \$9,700 building at Corsicana, Texas.

It is stated that the Texas & Pacific Railway will build machine shops at Fort Worth, Texas.

A stock company has been formed at Valley Mills, Texas, that will probably build a flour mill.

W. A. Rhea, W. A. Kendal, John C. Newburn, J. M. Lindsey, J. C. Hutchinson and others have incorporated the Pilot Point & Western Railway Co., capital stock \$500,000, to build a road from McKinney to Gainesville, Texas.

A company is being organized at Fort Worth, Texas, to manufacture brick extensively.

## WEST VIRGINIA.

The Monongahela Gas Coal Co., of Baltimore, have transferred their mining property in Harrison county, W. Va., to the Howard Coal & Coke Co. of that State. The latter company will repair and improve the plant and build 100 new coke ovens.

J. Perdue is erecting a saw mill at Coon's Mills, W. Va.

A tobacco factory will be started at Winfield, W. Va., by J. L. Middleton and J. H. Dudding.

A new company has been formed under the name of Lewis, Morris & Co. to mine coal in Kanawha county, W. Va.

## BURNED.

The Barytes mill of T. J. Corbin, near Berger's Store, Va.

The ginny of C. L. Illges, near Glenville, Ala.; loss \$2,000.

D. M. Rodeffer's mill at Citra, Fla.

PALESTINE, TEXAS, March 10, 1886.

Editor Manufacturers' Record:

The Eureka Manufacturing Co. has bought the whole plant of the Eureka Cotton Gin & Corn Mill Manufacturing Co., of Palestine, Texas. We are prepared with abundant capital to run the factory at full capacity. We manufacture cotton gins, feeders, condensers, corn mills and other implements. We want the agency of a good engine and cotton press to put into the hands of our traveling agents.

A. H. BAILEY.

LOCKWOOD, GREENE & CO.

MILL ENGINEERS

Office, 65 Westminster St., Providence, R. I.,

Carefully prepared plans, specifications and estimates furnished for the construction, equipment and organization of new mills and the revision and improvement of old.



**A Tannery.**

GLEN ROSE, TEXAS, March 9, 1886.

*Editor Manufacturers' Record:*

A stock company has been organized at Glen Rose for the purpose of building and operating a tannery. Cedar leaves, which have been tested and proven to be a first-class tanning material, are to be used instead of oak of bark. Suitable grounds, with an artesian well of pure, white sulphur water, is on the ground, running 100 gallons per minute; and building material has been ordered. Mr. William Allen, an experienced tanner, is president of the company.

J. W. KINCAID.

**\$200,000 Gas Co.**

AUGUSTA, GA., March 11, 1886.

*Editor Manufacturers' Record:*

As soon as we obtain a charter we will construct works. Our capital stock will be \$200,000, actually paid in. Our stock list comprises over 200 of our leading merchants.

MUTUAL GAS LIGHT CO.

**\$200,000 Coal Co.**

MOBILE, ALA., March 13, 1886.

*Editor Manufacturers' Record:*

We have organized the Coal Creek Coal Co.; authorized capital stock \$200,000. Have bought and paid for 6,200 acres coal lands.

M. LYONS.

CORNICANA, TEX., March 8, 1886.

*Editor Manufacturers' Record:*

The Jenny Electric Company, (Indianapolis,) is lighting our city of 6,000 inhabitants from a tower 125 feet high. Capacity of elevator has been increased about 100,000 bushels. Gas works will begin building in a few weeks. The ice factory is just ready for business, and has been bought by a Mr. Trimble, late of Tennessee. Our citizens are ready to identify themselves with any laudable enterprise to the extent of one-third to one-half of necessary capital and sell at any time the other party or parties want to buy.

M. DRANE &amp; SON.

**125-Barrel Flour Mill.**

ALBANY, TEX., March 10, 1886.

*Editor Manufacturers' Record:*

This company is incorporated under the laws of Texas. Our mill will have a capacity of 125 barrels daily. The Nurdyke & Marmon Co., of Indianapolis, Ind., have the contract for the machinery. We are now just starting the building. It will cost \$6,000. Expect to be ready for operations August 1st.

ALBANY MILLING CO.

LOUISVILLE, KY., March 15, 1886.

*Editor Manufacturers' Record:*

We have incorporated, capital stock \$50,000. The incorporators are Embury L. Swearingen, William M. McElwee and Peter B. Myers. We make yarns and hosiery.

SWEARINGEN MFG. CO.

**Mining Work Resumed.**

BLUE WING, N. C., March 13, 1886.

*Editor Manufacturers' Record:*

The Big American Copper Mining Company resumed operations last Wednesday on their large tract situated a short distance from this place. The work of unwatering the mine is now being prosecuted in earnest, after which sinking will be commenced.

C. W. EDCUMBE.

**\$100,000 Furnace Manufacturing Company.**

KNOXVILLE, TENN., March 12, 1886.

*Editor Manufacturers' Record:*

The Scates Warm Air Furnace & Manufacturing Company has been incorporated at Nashville, Tenn., with a capital of \$100,000.

The incorporators of the Scates Warm Air Furnace & Manufacturing Company are William Morrow, E. B. Stahlman, of Nashville; John C. Hank, P. W. Beech, of Knoxville; A. M. Hughes, Jr., of Columbia, Tenn., and Horace Foster, of Sheldon, Ill. Manufacturing is to commence at once.

P. W. BEECH.

**Cotton Mills to be Enlarged.**

GRAHAM, N. C., March 13, 1886.

*Editor Manufacturers' Record:*

I have bought the Sidney Cotton Mills of Scott, Donnell & Scott, at this place, and will add 90 to 100 looms.

L. BANKS HOLT.

**Cotton Seed Oil Mill.**

GALVESTON, TEX., March 10, 1886.

*Editor Manufacturers' Record:*

We intend erecting an oil mill here.

TEXAS STANDARD COTTON OIL CO.

SAMSON HEIDENHEIMER.

CHATTANOOGA, TENN., March 15, 1886.

*Editor Manufacturers' Record:*

We have decided to build a grain elevator at this place with capacity for storing 50,000 bushels of grain. Will commence to erect same at once and hope to have it completed by the first of August. The members of the firm are Thomas H. Cheek, formerly of the Kennesaw Mills, Marietta, Ga.; J. D. Buttolph and myself. It will be a private enterprise under the firm name of Eakin & Co.

ALBERT EAKIN.

PARIS, TEXAS, March 11, 1886.

*Editor Manufacturers' Record:*

A stock company is being organized in this place for the erection of a \$90,000 cotton gin. Three new lines of railway are expected to enter this city before the close of the present year. Construction work is being rapidly pushed on two of them now. Notwithstanding the labor troubles, Paris is bound to boom this year. There is no better place for the investment of capital in the State of Texas than this.

C. H. MERRY.

KNOXVILLE, TENN., March 13, 1886.

*Editor Manufacturers' Record:*

J. R. Norton, of Ironton, Ohio, contemplates erecting a factory for the manufacture of hoes and other agricultural implements at some point in East Tennessee.

H. N. SAXTON, JR.

**Machine Shop.**

CORINTH, MISS., March 15, 1886.

*Editor Manufacturers' Record:*

I will add to my plant this spring two new lathes and a boring mill that I will buy soon. I will erect a two-story brick shop this summer. Am getting out new line of engine patterns.

W. T. ADAMS.

THE managers of the Kimball House, Atlanta, displeased at some strictures in the Atlanta Capitol, about the lack of courtesy of some of the Kimball clerks, have forbidden the Capitol to be sold at its news stand. If this is a sample of the judgment displayed in the management of the Kimball, the compliments about that house are doubtless well founded. The Capitol has at least been well advertised free of cost.

**Law Department.**

Edited by B. HOWARD HAMAN, Attorney at Law, Baltimore, Md.

It is the province of this Department to reply to enquiries that may be made by our patrons respecting the legal aspects of any matter that may arise in their business. Any questions as to doubtful points of law will be answered without charge in this column. All questions submitted must be accompanied by the name and address of the sender, not however, for publication. Letters should be addressed, Editor Law Department, MANUFACTURERS' RECORD.

*Editor Law Department,**Manufacturers' Record:*

There are several Baltimore capitalists who are going to put up money to start an incorporated concern in this State. We wish to file the articles of incorporation in Maryland if it can be done. Is it possible to do this unless some of the land in which the company is going to deal is situated in the State of Maryland? All the operations are to be conducted in West Virginia. Is it necessary to give any notice and take much time in order to form a corporation in Maryland? Your early reply to the above questions will oblige me.

L. C.

CHARLESTON, W. VA., March 10, 1886.

*Reply*—Such an incorporation as you wish can be effected in Maryland. It can be done at short notice. Corporations are produced in this State with great rapidity. It only requires five persons to sign a printed blank and file it in the clerk's office.

*Editor Law Department,**Manufacturers' Record:*

I have a judgment against a man in Warsaw county, Va., who owns one-tenth interest in a tract of land. How can I realize on my judgment? If I buy in the one-tenth interest can I afterwards sell the whole tract and get my money out?

G. N. T.

NEW YORK, March 18, 1886.

*Reply*—Yes; you can first buy in the one-tenth interest for your claim and then have the whole tract sold.

*Editor Law Department,**Manufacturers' Record:*

I would like a speedy reply to this question if it is convenient. I have sent on a claim for money borrowed to an attorney in Meriden, Conn. He has started the proceedings by attaching the property of the man that owes me the money. I filed no bond. My Connecticut attorney tells me that this is all right, but I am threatened with a damage suit.

BALTIMORE, March 15, 1886.

MERCHANT.

*Reply*—Your Connecticut attorney is right. The damage suit will not be a profitable one to the other side if your debt is an honest one.

*Editor Law Department,**Manufacturers' Record:*

I am written to by a Baltimore lawyer who tells me that under certain circumstances open accounts in your State are not barred by limitation within three years. In support of this opinion he relies on the fact that the claim is a mercantile one. Would there be any chance of making such a claim after three years in Maryland?

J. L. P.

PHILADELPHIA, March 13, 1886.

*Reply*—Yes. There are no limitations on mercantile claims where a creditor lives outside of the State and the debtor lives in Maryland.

**LEGAL JOTTINGS.**

Judge Brewer, in an unique address before the Kansas State Bar Association on the subject of libel, stated it as his opinion that a fine of \$1,000 ought to be added to the verdict in every libel case. In support of this generous view, he says as follows:

"I believe in the virtue and value of punishment; it is wholesome for the individual and beneficial to society. The tintinnabulation of your mother's slipper on that part of the body in which the spinal column has, in the language of the railroad men, its 'terminal facilities,' may not have been music for the present, but was sweet song for the future. It was punishment for wrong done—inducement to coming right."

In *Dias vs. Chickering*, the Court of Appeals of Maryland have just decided an interesting point: "A piano was consigned to A. & B., a firm, who were authorized to sell it for cash. A., one of the firm, with the assent of his partner, removed it to his resi-

dence for private use, and it was subsequently sold to defendant for \$250 cash. He was unaware of the relation of the firm in regard to the piano, he taking a receipt therefor. In an action of replevin brought by the consigning firm, *Held*, that the defendant was a *bona fide* purchaser, and a judgment in favor of the plaintiff should be reversed."

ONE year ago the Enterprise Cotton Factory, of Augusta, Ga., was thought to be hopelessly ruined through the dishonesty of one of its officers. After a hard struggle sufficient money was raised by selling bonds to tide over the trouble, and Mr. J. P. Verdery was elected president. For the first six months the depression in the cotton goods trade was so great that the mill was operated at a loss, but during the last six months the profits have been sufficient to wipe out the loss of the first six and leave a balance of \$2,643.13. In view of this, the president, in his annual report, says: "Everything considered, the result is very gratifying, and clearly demonstrates the capacity of this mill to make reasonable profits in ordinary times." This is but another proof of the improved condition of Southern cotton mills during the last five or six months, and shows that prosperous times have once more returned to this industry.

EVIDENCES of the prosperity of Southern Cotton Mills are multiplying. The net earnings of the Muscogee Cotton Manufacturing Company, of Columbus, Ga., for the past year were 14 per cent. on the capital stock. A dividend of 6 per cent. was declared, and the balance added to the surplus fund. The mills have sold full up to the production.

MR. W. F. WOODWARD, late president of the Woodward Iron Co., of Alabama, lately reported in the MANUFACTURERS' RECORD as contemplating the building of nail works in Birmingham, is credited with having sold for \$900,000 his interest in the Woodward Iron Co., which cost him a few years ago \$300,000.

CORRESPONDENCE relating to the manufacturing, mining, lumbering and all other material interests of the Southern States is solicited. Reaching so many capitalists in all parts of the United States seeking profitable investment in the South, the MANUFACTURERS' RECORD offers an excellent chance for the people in that section to place the advantages of each locality before those likely to be interested. We will take great pleasure at all times in telling what has already been accomplished in the South, and showing up the opportunities of doing still more.

MR. SAMUEL E. FORWARD has left the position of carder at Mountain Island Mills, N. C., to accept a similar one with W. J. Dickey & Son, near this city.

THE Hooper Mills, at Mountain Island, N. C., work one hour less per day than any other mill in the South.



### The Brightman Mechanical Stoker and Smoke-Preventing Furnace.

This furnace is a result of many years of study and experiment by Mr. J. W. Brightman, of Cleveland, O., who has had unusual facilities for thorough investigation of the scientific problems involved, as well as for the construction and personal application and test of the requisite experimental mechanical details. It is designed primarily for economically burning disintegrated bituminous coal, usually known as "soft slack," and will consume the finest soft-coal dust without waste of fuel, and with economical steam-making results.

In the consumption of bituminous coal, especially the lower grades, with ordinary furnaces, volumes of dense smoke escape from the chimney, that are not only objectionable to the community and frequently unlawful, but also involve some loss in unconsumed fuel. The objectionable feature of coal smoke in the atmosphere is the carbon contained therein. Carbon is one of the principal elements of the fuel, and in a properly constructed furnace is entirely consumed, whereby two important objects are attained: 1st. The fullest possible utilization of the carbon in heat-making and steam production. 2d. The abatement of the smoke nuisance.

There are numerous smoke burners in the market, some of which have proved more or less efficient in the avoidance of smoke, but the experience of all users of such devices demonstrates that they are far from economical, are of short life, and open to other very serious objections. The burning of smoke requires an increase of fuel over that required when the combustible gases are ignited and burned at the instant of generation and before such gases, by cooling and dilution, become smoke. Again, the intense and concentrated heat necessary to burn smoke soon destroys the "smoke-burning device, and is liable to prove injurious to the boiler in ways that are obvious to every engineer of experience. It is claimed that no objection of this character can be urged against the Brightman Furnace.

The mechanical operation of the Brightman Furnace will be readily understood by inspection of the accompanying cuts showing its construction.

The coal is first thrown into a hopper, conveniently located for the purpose along the front of the furnace, and thence is automatically fed, evenly and in small quantities, to the front part of the grate bars and without exposing any opening through which cold air can enter the combustion chamber over the fire.

The grate bars are inclined at an angle of thirty-four degrees from the horizontal, and are made with lateral lugs which overlap each other so that there are no vertical openings between the bars. The entering fuel, being exposed to the heat radiated from the interior walls, undergoes a coking process by which the gases are expelled. As the coal becomes thoroughly ignited, it is moved along by the action of the grate bars, the combustible gases being entirely consumed.

Each alternate grate bar is kept in constant motion longitudinally; this motion, combined with gravity, causes the fuel to move regularly towards the rear of the furnace. All fuel on the grate bars moves simultaneously. This movement is positive and it may be varied as the demand for steam production varies.

This constant and regular movement insures a uniform thickness of incandescent fuel, a sufficient supply of air through the inclined grate bars, through the supplementary grate at the rear and through the dumping doors, and a near approximation to perfect combustion.

The draft openings through the grate bars are horizontal, and consequently fine fuel cannot fall through and be thus wasted.

The hopper is of sufficient size to contain several bushels of coal, and the attention required is confined to keeping the hopper supplied with fuel and to the occasional removal of the ashes from the ash-pit beneath the supplementary grate. Clinkers do not form on the inclined grate bars; all such re-

stant stream of highly heated air mingles with the gases from the fuel on the inclined grate, and by supplying heated oxygen insures the combustion of such gases.

The movement of the grate bars and the feeding mechanism are variable, and may be quickly adjusted to move more or less

fire in any manner whatever. The ashes pass to and through the supplementary grate into the ash-pit. By virtue of the mechanical feed one stoker will suffice where two or more are required for a battery of boilers using ordinary furnaces.

The power required to move the automatic

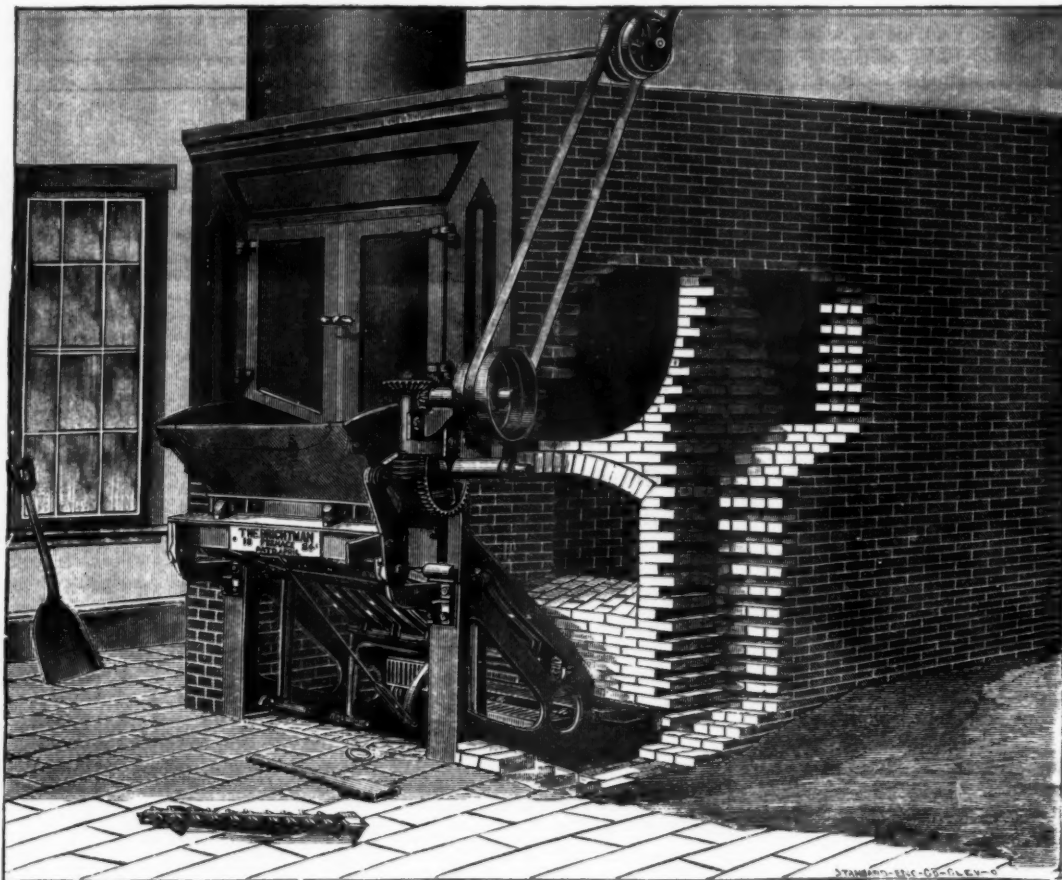


FIG. 1.—View of a Brightman Furnace as applied to a 60 H. P. Tubular or Flue Boiler with full Cast Iron Front.

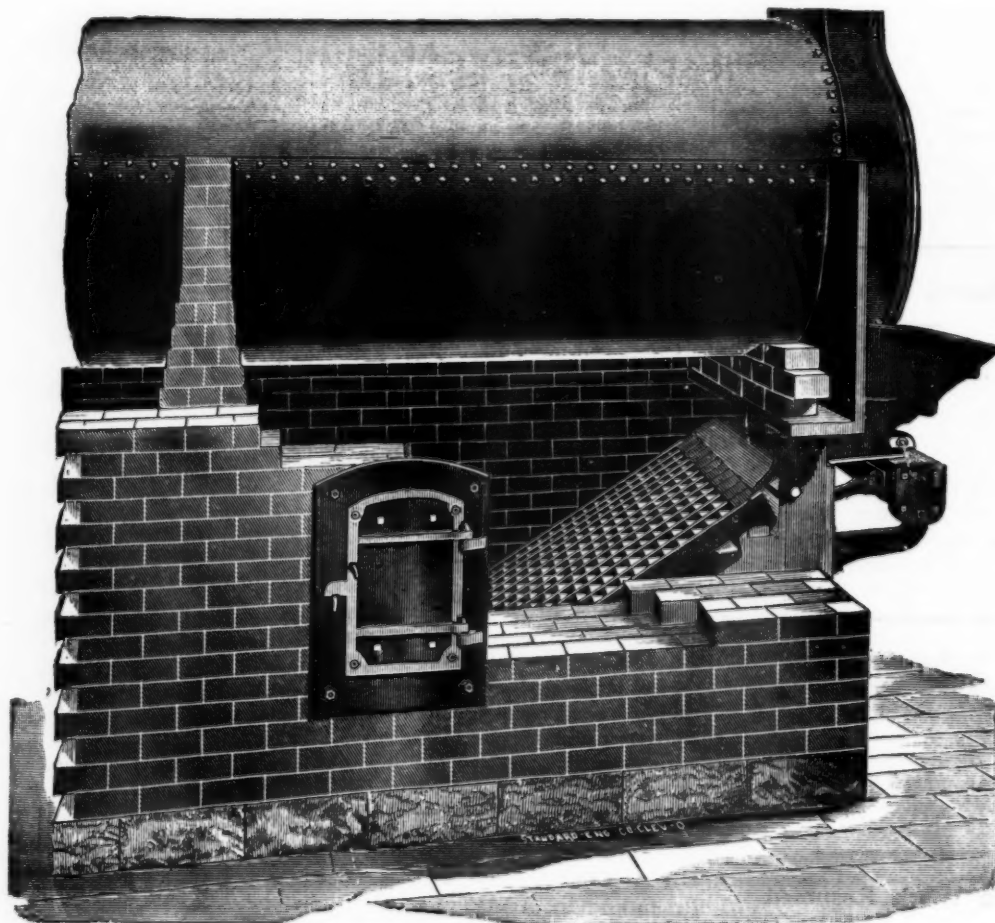


FIG. 2.—Side view of Brightman Furnace applied to Horizontal Cylindrical Boiler with ordinary Sheet or Cast Iron Smoke Box attached to Boiler Head.

fuse accumulates on the supplementary grate bars, and is removed once or twice per day, according to the nature of the fuel and the rapidity of such accumulation. The heat of the clinkers is absorbed by the air drawn through the supplementary grate and through the dump doors in front thereof; this con-

stant stream of highly heated air mingles with the gases from the fuel on the inclined grate, and by supplying heated oxygen insures the combustion of such gases. The movement of the grate bars prevents the formation of clinkers and removes the ashes from the grate. The clinkers are removed from the furnace by a dumping door situated at the rear of the inclined grate bars, and without disturbing the

feed is trifling; the whole may be easily moved by hand, as is done when the fire is first made, steam not yet being raised. The automatic device may be driven by a belt from any convenient shaft, and power may be applied at any angle, or a special engine may be used, as may be found convenient,



It may be worked by hand with comparatively little labor. The furnace and its attached mechanism are simple, durable, convenient and in every way effective. The perfect combustion attained by this furnace tends to prevent the deposit of soot in boiler tubes and flues. The efficiency of the boiler is thereby increased, and much labor in flue cleaning is avoided. The Brightman furnace is not a complicated machine. It is said that any boy capable of using a shovel can attend it and perform other work besides. It is adapted to boilers of any shape or size.

In Fig. 3 is shown an outline cut of Brightman furnace applied to an ordinary tubular or flue boiler with sheet iron breeching to chimney. A—is the fire-brick arch over smoke passage in bridge wall. B—smoke passage through bridge wall. This passage is equal in width to that of the grate, two feet high in front and eighteen inches high in rear, the floor of the passage sloping upwards towards the rear. C—bridge wall cutting off all communication between the combustion chamber and space in rear of bridge wall, except through the smoke passage, B. D—door for access to interior of furnace. E—boiler supported as usual. F—grate bars.—Each alternate bar has a horizontal reciprocating motion variable within limits of  $\frac{1}{4}$  inch to 1 inch. Lugs cast on either side of contiguous grate bars overlap each other, the air openings between these lugs being horizontal. G—dumping door for removal of clinkers, etc., from the supplementary grate. This supplementary grate is cleaned once or twice per day, according to the quantity of coal consumed. H—rod for opening and closing the dumping

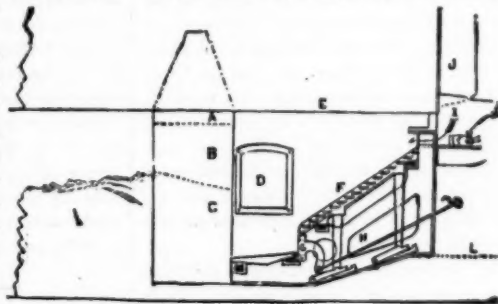


FIG. 3.

Brightman mechanical stoker only, concerning which additional information may be had from the manufacturers, The Brightman Stoker Co., Cleveland, Ohio.

### Some Advantages of the South.

BY M. B. HILLYARD.

#### CLIMATE.

There are some advantages the South possesses and must ever possess over the North and West. One of the most conspicuous of these is climate. Let us consider this in some of its more prominent aspects—saving in fuel, clothing, food to man and beast, etc.

Take fuel; compute the consumption of the aggregate of Southern cities and towns, and a like aggregate of population in Northern cities; consider that the consumption of fuel over the average territory of the South and North would be fully three months longer in the latter than the former; and the much greater consumption North during the months both use fuel for comfort, together with the three months mentioned, (when the South virtually does not use it for comfort,) would give fully three months advantage to the South over the North in saving fuel for comfort.

Take the principal cities North—those of a population of 100,000 and upwards—New York, Philadelphia, Brooklyn, Boston, Chicago, St. Louis, Cincinnati, Cleveland, Buffalo, Detroit, Jersey City, Newark, Milwaukee, Pittsburgh, Providence. These cities show in the aggregate, in the Census Report for 1880, 4,686,467 people. Allowing only fifty cents consumption of fuel *per capita* for three months, the aggregate will amount to over seven millions of dollars. Surely it is much within bounds to say that all the other cities of the North consume three times as much more, and at least, at a like cost, for the time in question. Any one can see then that the South saves annually a round sum of money in the cost of fuel. Then the cost of stoves and, above all, heating appliances will swell the cost of fuel to a much larger amount than I have named. In the South the open fire-place is the most in vogue.

The farmer can estimate the cost of winter at the North—in the expense of feeding live stock five months in the year. Let us take some figures and make some computations upon them. Below is given a tabulation which shows the live stock on farms in the following States: Connecticut, Illinois, Indiana, Iowa, Maine, Massachusetts, Michigan, Minnesota, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, Wisconsin, June 1, 1880. Several States and territories are omitted because there are some who would say of them: "They have their corn, and must feed

it to their hogs and cattle, or they could do nothing. Their hay costs nothing but cutting, and it is worth nothing, for they can't sell it, as there is no demand." I give States where corn and hay are salable, and have a good cash value. The man who could, by some magic, have green pastures there in winter, could certainly pocket the value of the hay and corn he is forced, at that time, to feed to his stock.

Horses.	Mules and asses.	Working oxen.	Milch cows.
5,609,992	298,763	288,793	7,820,765
Other cattle.	Sheep.	Swine.	
8,955,539	16,070,430	21,131,279	

Putting the cost of keep for winter, at \$15 per head for horses; for mules and asses, \$12 per head; for working oxen, \$12 each; for other cattle, \$10 each; milch cows, \$10 each; for sheep, per head, \$1; for swine, each, \$3, we have as an aggregate cost for winter's feed of all the above animals—\$347,731,151. The sum is almost incredible. (In this estimate I did not rely on my own views, but recently submitted the matter to noted stock-raisers. Of course, the estimate varies according to length of winter, prices of feed, etc. I have, however, put the figures very considerably below the estimates of the gentlemen mentioned.)

But some one may say will not these animals sell for so much more North than they would South as to pay all if not more than this higher cost of winter's "keep" at the North? Well, the answers to this question are many. In the first place, for by far the larger proportion of this computation, the food contributed to support will not count as a factor in gain; for the animals are not fed for fattening with a view to sale. Steers, hogs and sheep, possibly, may; but horses, mules, working oxen and milch cows are not. For all these the computation represents the bare cost of "keep" and the maintenance of condition. If you shall say that the cost of keeping the other animals will be got back in their enhanced value, by reason of the fat they will lay on, the reply is, then you must increase the cost of the estimate upon them. Then, if milch cows are to be added to the gainful side, by reason of their butter or milk yield, more must be added to their cost of "wintering." In other words, are not plenty of people North and East willing enough to let one have the use of a cow for "wintering" her? Can any one suppose, too, that the value of a cow North for her butter or milk is greater than at the South? Is milk anywhere in the South worth less than ten cents per quart? or butter worth less than twenty to twenty-five cents per pound? Are not millions of pounds of Northern-made butter carried South? Is not grass-flavored Southern butter from grade Jerseys worth from twenty-five cents to forty cents per pound? Is not fancy all-Jersey butter worth from forty cents up to prices too high to be credited? Do mules sell higher in the North than in the South? Is not the South the great market for them? Are not horses worth more South than North? Is a hog worth more North, as compared with the South, than the cost of his winter's food? Pray, where does a large part of our pork come from? What has kept the South poor so long but, among other things, buying Western pork?—(soon, fortunately, to stop.) Where do Southern cities get their live hogs from? They are hauled from the West by hundreds of carloads daily. Do we not get our best fat beeves from the North and West?

But there are other aspects to this matter of winter's "keep"—a factor hard to weigh; an unknown quantity; the superior health of the animal South; or, rather, the greater cost of the inferior health North. Every one knows the bad effects of confinement of sheep in close barns in winter. I have known of much money lost in one season in only one herd of fine Merinoes. Who does not know the impaired quality in wool in the change from green to dry food in winter, and *vice versa*, in spring? The loss in cattle in these transitions is more or less by reason

of diseases and complaints incident to it. Because we cannot compute it, it is none the less true. The fields of much of the South can be kept green the year round with bluegrass, the clovers, etc. On them every animal is naturally kept in better health than on the artificial food of corn and hay.

There is a great temptation to dilate upon the enormous losses in some winters, and the very considerable every winter, in the aggregate, at the North and West, by the freezing of animals, or their death by some incident in connection with cold. From this the South is exempt, except in parts of Texas, where the "Northerners" sometimes catch stock.

The saving in food and clothing to man, by reason of the climate, is a topic it would be interesting to explore at length; but I can but barely touch upon it, hoping the reflection of the reader will supply my meagreness of treatment.

The mildness of the Southern climate over a large area gives the opportunity to draw largely for the support of life (and even for money-making) upon the winter garden. "Greens" of all sorts are to be had there in winter. The Irish potatoes planted in July or left in the ground bear a second crop, from which a winter's supply is to be had. Cabbages "set" in the fall grow through the winter. Lettuce and radishes can be planted at all times. So through the list. The ground from which the crops of corn, cotton, oats, wheat, rye, barley, etc., are taken is available for turnips, cabbages, carrots—what you will—and needs not to lie unutilized till spring. Your hens are laying eggs all winter, and chickens can be hatched in fall. Your ewes can be made to "lamb" in November. Your cows can "come in" when you please in winter. In large areas of the South the finest fish can be had much of the winter in the salt and fresh waters; crabs, shrimp and oysters all winter in parts of the South; and I do not elaborate the migratory birds that, forsaking the North in the winter, bring choice contributions of the most prized food supply to both the epicure and poor man, in this season, to the South.

In clothing, the aggregate of cost to be saved by the South in winter, as compared with the North, is very considerable. The increased quantity of wool in the character of goods worn North, of necessity, counts very heavily in money's worth, as compared with that worn South. It is one of the discomforts that Northern people suffer who "winter" pretty well South, in persisting in wearing the same clothing South they are habituated to at home. Less bed clothing is necessary, too. Lap blankets, buffalo robes, are a trifling expense South. Indeed, there are hundreds of thousands of people South who never saw a buffalo robe. In an experience of a good many years South, I never have used, never have seen a buffalo robe on but two or three occasions. There are plenty of children of the poor in the South whose feet are innocent of shoes the whole year round. It is useless to say that they ought to wear them. They do not, and are very robust. I have seen plenty of children clad in next to nudity in midwinter South, and they could not be more healthy than under this treatment.

These matters may seem quite trivial, but aggregate them, and the cost will be found to be very considerable. Indeed, there is the germ of an industrial revolution in the thought that there is not the ratio of consumption South to the ratio of production as at the North and West. Look how much of the wool, pork, hay, corn, wheat, etc., that the Northern man produces, which he and his stock must consume! South, in winter, he and his stock not only do not consume much of these, but he is producing at the very season the Western man is consuming.

In a view of "points," I ought not to omit the expense of buildings and barns, particularly the latter, so often expensive, which at the South find a substitute in comparatively cheap and open shelters.

[TO BE CONTINUED.]

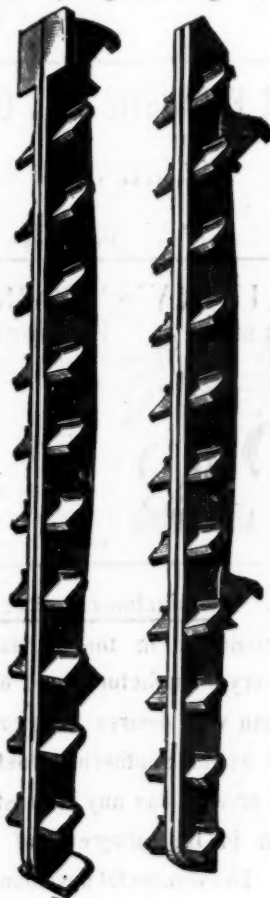


FIG. 4.

door. I—hopper, to be kept filled with coal. The arrow shows the passage of coal from the hopper to the grate bars. The coal is pushed through this passage by the reciprocating slide shown at the bottom of the hopper. J—breeching for conveying products of combustion to chimney. L—floor line.

Fig. 4 presents a view of Brightman's patent reciprocating and interlocking grate bars, supplied with the Brightman furnace. These bars are provided with lateral lugs or



## MINING NOTES.

By T. K. BRUNN, Salisbury, N. C.

### SHIVE MINE.

The Shive mine, located in Cabarrus county, is under the control of Mr. S. C. Miller, of Salisbury, N. C. He has had a new shaft sunk to the depth of 25 feet, and six or eight tons of the ore exposed on the dump. He sent several tons of this to the Yaddin Chlorination Works, at Salisbury, where it was reduced and the precious metal extracted. It yielded an average of more than \$20 to the ton. The property embraces 45 acres, a long narrow strip, which "straddles" the vein. The vein is  $2\frac{1}{2}$  to 3 feet in width, and is traceable for more than a mile. The ore is a brown free-milling quartz. Mr. Miller is sanguine as to the value of the property, which he affirms is as good as any in Cabarrus county. There is a prospect just now of the mine being worked on a large scale. The test run mentioned above proves the value of the material and the size of the vein proves its abundance.

### THE ELLER MINE.

in Rowan county, will be opened by Messrs. J. S. McCubbins and S. R. Harrison, of Salisbury. The ore is a rich free-milling brown quartz, and has been described in the columns of the MANUFACTURERS' RECORD.

### HOLTSHOUSE MINE.

also in Rowan county, which has been opened by Professor Tiernan and favorably reported on by him, has been accepted, and machinery is to go up there at an early day.

### BIG BONANZA MINE.

The Big Bonanza mine, nine miles south of Salisbury, is just now receiving the attention of moneyed men. The vein on this property is from 3 to 5 feet wide; has been opened to a depth of 30 feet and is traceable for 1,200 feet. It has been cut into at three places in this length and the ore body found to be uniform. The ore is a free-milling brown quartz, of low grade, and may change into sulphurets below the water line. The gentlemen now interested will come to a decision within 30 days, which, should investigations prove satisfactory, will result in opening the mine on a permanent basis.

### PROSPECTING.

Mr. H. H. Crowle, a practical miner and a good prospector, has been doing some good work in Rowan county. He has discovered three new localities, where gold in paying quantities is found.

### NEW FIND IN MONTGOMERY.

Mr. J. D. Munn reports the discovery of a new and valuable find in Montgomery county. The vein of ore, indicating the presence of both gold and silver, was found on his place in Hollingsworth township, a few miles southeast of Troy, the county town. The pinnings, it is said, show both metals, the gold predominating.

The Russell, Coggins and Steele mines in that county are all going full blast. The force of hands employed at each is being increased.

### HAILE MINE.

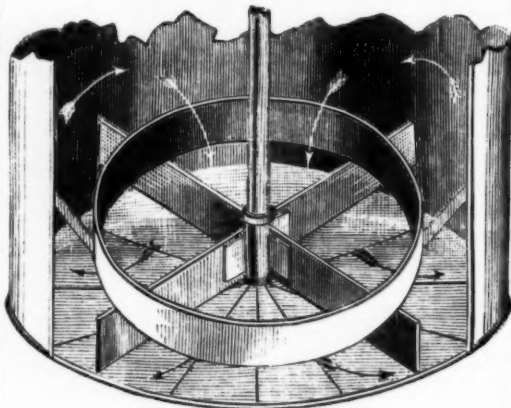
At the Haile Mine, in South Carolina, a large amount of work is being done. The new system of Blake crushers and rolls recently introduced, is now in full operation and doing good work. They were put in on trial and have not yet been accepted, but from the indications the trial will prove entirely satisfactory. They have a large force at work and they need them, for every twenty-four hours they mine and mill 200 tons of ore. The ore body is immense, being about 60 feet wide. The ore is low grade, but is of uniform average value and pays a good percentage on the investment. The present management seems to be of the most approved kind, characterized by intelligence and economy. This kind of an equipment would make some of the mines now idle or

unproductive, scattered throughout the Southern States, tell a different tale in a few months. It is a matter of surprise to unobserving ones how so many mines have failed, but if they would take the fast living and ignorance (of mining and metallurgy) into the count, it would explain the majority of all the failures in this branch of industry.

### BY COUNTIES.

There are more than 300 mines in the "gold belt" of North Carolina. It may be a help to those interested to have a brief sketch of the more important localities, and a list of the minor ones, by counties. The series will be commenced in a short time.

THE Anniston (Ala.) Hot Blast reports what it claims to be a wonderful invention by a European scientist, which is to be patented in this country through a business man of Anniston. The Hot Blast says: "From an inspection of the drawings accompanying the letter, the apparatus consists of a large globe of phosphor-bronze metal some four inches thick and of a capacity of from ten to fifteen tons. It is mounted on a hollow shaft ten inches in diameter, with the whole revolving on roller journals. The globe has an opening large enough to admit the quartz to be dumped into it from the floor above, the ore being previously dried so as to have the smallest possible amount of moisture in it before being put in the spherical retort. The opening is then closed by a large plate, wedges and key. The spherical retort is revolved by gearing for a few min-



NIAGARA PHOSPHATES MIXER.

utes, the chemicals at the same time being forced into the retort through the hollow shaft at one end, while the sulphurets, decomposed by the chemicals, are forced out of the end of the hollow shaft into a large reservoir where the whole is condensed and precipitated. The filling of the revolving retort and dissolving the quartz does not occupy over thirty minutes, when the door of the retort is opened and the dry powdered quartz is discharged into a large bin whence it falls like grain into the hopper of a mill. It is received in a room below on a large circular concave, bell metal plate, twenty feet in diameter, which revolves with sufficient rapidity to throw all the light dust of the decomposed quartz to the outside of the revolving disk. The current of air created by its revolving throws off all the quartz dust, which, in turn, is blown away by an artificial breeze, while the fine gold works its way to the center through which a small pipe is inserted. The gold passes through this pipe to a small chamber below, where strong linen bags, coated inside with tallow and oil, receive it.

It is found that by this process more gold is obtained than the quartz shows by analysis; that it is a scientific discovery of improving on nature's slow process of decomposing the quartz. This is evident from the increased yield of gold over the amount shown by analysis. The chemicals that dissolve the quartz and liberate the sulphur, increase, in some way, the yield of gold.

The most important discovery, however, in this process, is a new metal produced from the sulphurets that are condensed,

chemicals that decompose the quartz so changing the condensed sulphurets that they can be easily smelted, producing a metal of a light straw color, of extraordinary hardness and of a density nearly equal to gold. This new metal cannot be bent, but has a tenacity of over two hundred thousand pounds per square inch, and is so hard that no tool will cut it. In addition it has the remarkable property of remaining fluid (when melted for a long time), the melted metal running thinner than water. Perfect impressions can be made when it is poured on the finest steel engraving plate. Castings can be run from it thinner than paper. A sword made of it will not bend and can hardly be broken, while no substance can resist it. The metal has proven to be so fine in its molecular structure that instruments made of it realize the fable of the Soldan sword that divided a hair laid across it and cut through a bar of iron at a single blow without injury to the edge.

The new metal is produced cheaply. The whole process of dissolving the quartz, separating the gold, liberating the sulphur and converting it into metal can be so quickly done and on so large a scale, that, when it is brought into general use, the arts will be revolutionized, and gold will be produced in such quantity that it will be put on a par with or below silver. The whole business and commerce of the world will be quickened."

### The Niagara Phosphates Mixer.

This machine, protected by patent 328,585, October 20, 1885, has been specially designed for mixing phosphates and acid, and is constructed on the lateral displacement system.

The construction of the machine is such as to cause an intimate and continuously uniform intermingling of all the phosphate particles with the acid, and hence a certainty of perfect solubility.

Instead of being swung around during mixing the masses become thoroughly mixed by being drawn by suction from the surface downward through a cylinder, then by a centrifugal force thrown from the center outward over

the bottom and forced upwards on the walls to the surface and here again to the center and downwards, and so on continuously. A gate is provided below to empty the machine. Further particulars may be had from D. U. Jennings, 108 Liberty St., New York, where a working model of the machine may be seen.

### The Duquesne Forge.

This mammoth concern is one of the greatest institutions of its class. In it is employed machinery whose parallel, in this country, would be difficult to find, as it includes the most costly of American and English productions. Of these machines the most prominent are: A lathe fifty feet long, capable of turning a piece of work forty feet; a slatting machine with a fifty-four-inch stroke, the largest in the United States; an eighty-ton steam crane with a steam hammer of twelve tons, that will forge forty tons; four hammers fitted with steam cranes; ten furnaces and a mammoth fifty-ton traveling crane.

The main building (the old iron Centennial) covers an area of ground 150x300 feet, and through it sidings from the different railroads crossing the premises (over 10 acres in extent) have been laid. The Duquesne Forge is certainly ahead of the times in late facilities of powerful working capacities, and it is said in Pittsburgh that it is the only one to-day that is prepared to furnish the iron and steel for the government war vessels, should the national government carry out the suggested system of navy improvements.

Recently a large ocean steamship, on the point of sailing was discovered to have a cracked shaft. It was promptly removed and shipped to the "Duquesne Forge" for repair, and the engineer and owners fully expected to be delayed two weeks. Great was their surprise and pleasure to receive it fully repaired only three days from the time it had been received by the Forge Co.

The officers of the Miller Forge Company, limited, operating the Duquesne Forge are William Miller, chairman, and H. Miller, secretary and treasurer; and the main offices are located at No. 8 Wood street, iron exchange building, Pittsburgh. Mr. William Miller, the senior member is now the oldest forger in the United States, having been engaged in the business for over fifty years, and is at the head of an establishment whose celebrity has always been measured only by work of the truest merit. The works were originally founded in Pittsburgh in 1860, and were removed to Braddock in 1881.

MR. W. H. NORRIS, formerly with James A. Gary & Son, at Elysville, Howard county, is now second hand at the Hooper Mills, at Mountain Island, N. C. Mr. Norris will make his mark in his particular line, and his services are a valuable acquisition to any factory.

WE call attention to the advertisement in "Business Chances" of the owner of a Southern summer resort who wants a partner with capital to build a larger hotel and make other improvements, necessitated by increasing business. The opportunity is in all respects an inviting one.

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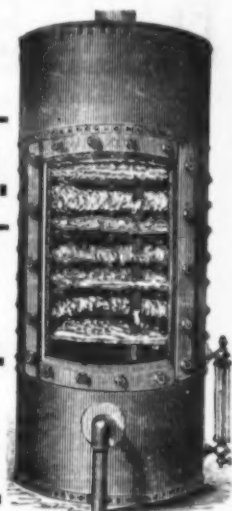
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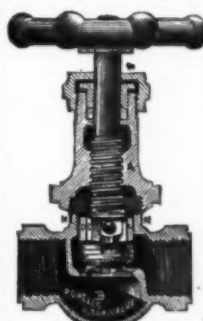
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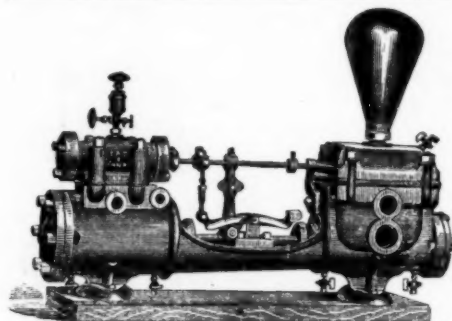
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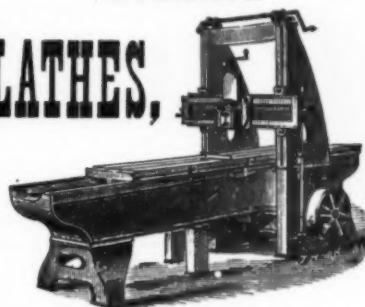
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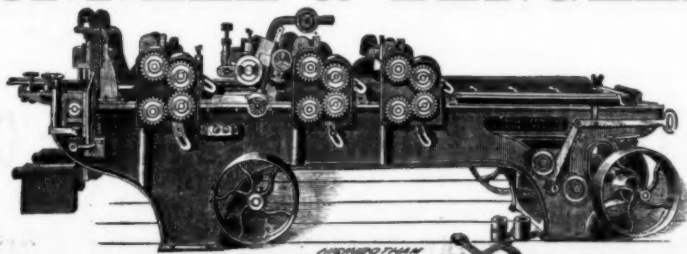
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# PARKER GAS AND ASOLINE ENGINE.

Guaranteed to Run with Less Gas than Any Other Gas Engine Known.

Always Ready  
to Start.

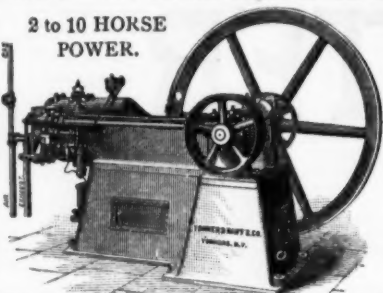
2 to 10 HORSE  
POWER.

Lighted by Electric  
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Simple.

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No Boiler.

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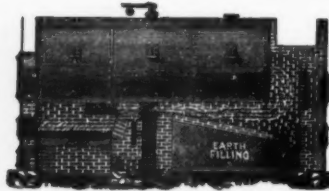
No Slide Valve to Get Out of Order. Does Not Hazard Insurance.  
No Small Parts to Clog Up. Is Noiseless in Running.  
Requires no Matches to Ignite the Gas. Can be Run with Any Kind of Gas.  
It is the only Engine that can be run equally as well with Gasoline Gas or Carburetted Air, as with regular fixed gas. Speed can be adjusted while running from 80 to 300 revolutions per minute.

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SEND FOR ILLUSTRATED CIRCULAR AND PRICE-LIST.

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### FOR SETTING STEAM BOILERS.



Economy of Fuel, with increased capacity of Steam Power. Like the Siemens Process of Making Steel, it utilizes the waste gases with hot air on top of the fire. Will burn all kinds of waste fuel without a blast, including Slack Coal, Sawdust, Logwood Chips, &c. Send for Circulars.

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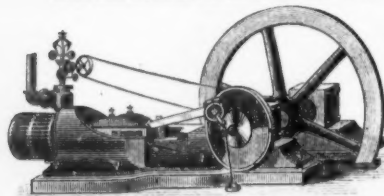
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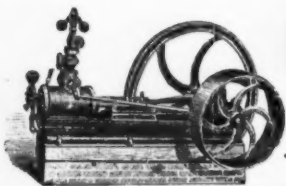
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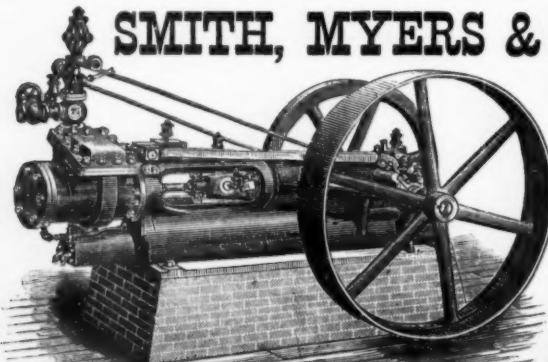
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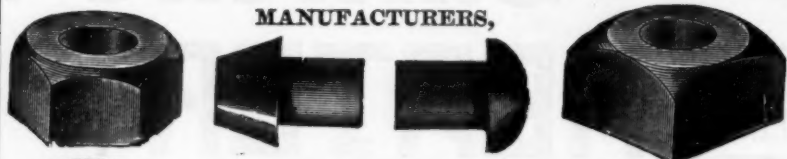
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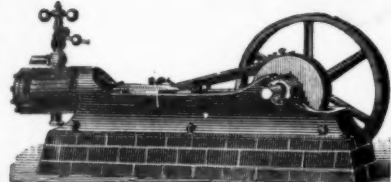
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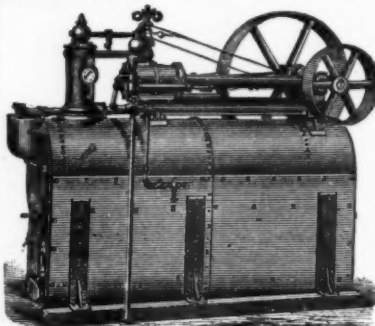
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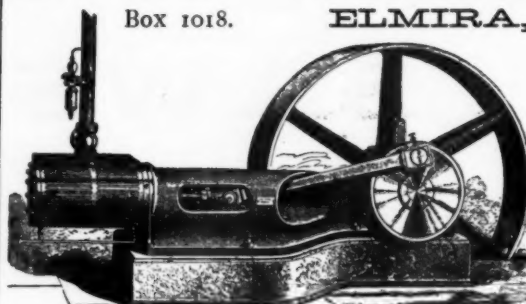
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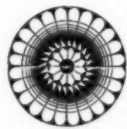
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GET THE BEST AT FIRST AND AVOID THE  
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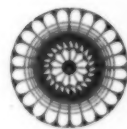
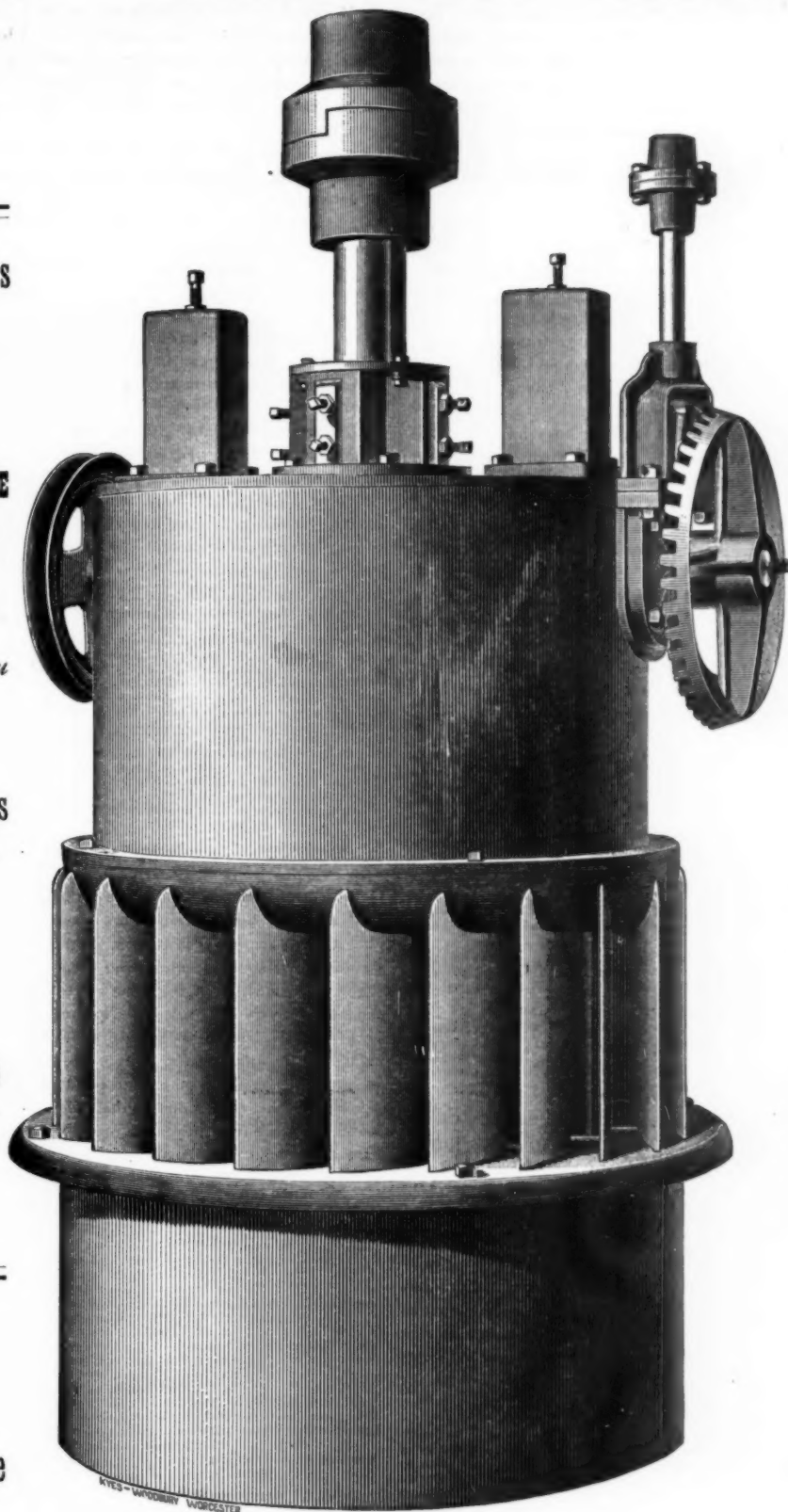
A Good Wheel Will Serve You  
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THE BEST IS THE CHEAPEST. IT DOES  
MORE WORK, LASTS LONGER, AND  
COSTS NO MORE FOR GEARS  
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The Hercules Gives the Most Power for its Size  
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When it is considered that  
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POWER COMPANY test  
every wheel that is put in in  
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manufacturers and charge  
them for the actual quantity  
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sizes, both right and left hand,  
have been tested, some of  
them many times, and all  
brought to the standard of  
excellence which has been  
set by the makers and de-  
manded by their customers.



Mills in Holyoke, Mass., using

## THE HERCULES WATER WHEELS

THE HEAD OF WATER ON THE WHEELS AND THE POWER FURNISHED BY THE HOLYOKE WATER POWER CO.:

	Diam. in inches.	Head on Wheels.	Horse Power.	Date of Setting.
Albion Paper Company.....	39	25	265	1878
Albion Paper Company.....	24	25	115	1883
Albion Paper Company.....	45	27	445	1880
Albion Paper Company.....	30	27	200	1883
Chemical Paper Company.....	4-30	23	620	1880
Chemical Paper Company.....	5-18	23	275	1880
Chemical Paper Company.....	33	23	185	1880
Chemical Paper Company.....	42	23	305	1880
Connecticut River Pulp Company.....	2-48	23	800	1880
Crocker Paper Company.....	36	18	155	1881
Farr Alpaca Company.....	32	25	300	1883
Franklin Paper Company.....	48	19	300	1878
Geo. R. Dickinson Paper Company.....	39	20	215	1883
Geo. R. Dickinson Paper Company.....	2-45	19	590	1883

	Diam. in inches.	Head on Wheels.	Horse Power.	Date of Setting.
Geo. R. Dickinson Paper Company.....	36	19	170	1883
Holyoke Water Power Company.....	30	19	115	1882
Holyoke Warp Company.....	48	11	130	1879
Massachusetts Screw Company.....	27	19	90	1882
Merrick Thread Company.....	48	12	150	1880
Newton Paper Company.....	48	21	350	1880
Nonotuck Paper Company.....	48	20	570	1881
Nonotuck Paper Company.....	27	29	175	1881
Riverside Paper Company.....	48	20	325	1880
Syms & Dudley Paper Company.....	45	29	495	1881
Syms & Dudley Paper Company.....	24	29	140	1881
Springfield Blanket Company.....	36	18	155	1877
The Beebe & Holbrook Paper Co. ....	24	19	75	1884

	Diam. in inches.	Head on Wheels.	Horse Power.	Date of Setting.
The Massasoit Paper Company.....	39	19	197	1883
Union Paper Company.....	45	20	285	1882
Union Paper Company.....	30	20	125	1882
Valley Paper Company.....	42	27	300	1882
Wauregan Paper Company.....	42	18	210	1879
Wauregan Paper Company.....	33	18	130	1882
Whiting Paper Company.....	27	18	85	1882
Whiting Paper Company.....	18	15	30	1882
Winona Paper Company.....	48	25	540	1880
Winona Paper Company.....	24	28	135	1880

Increase since..... 9,797  
Total ..... 10,576

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**HOLYOKE MACHINE COMPANY, Worcester, Mass.**

TEMPLE COURT, NEW YORK CITY.  
(Entrance, 5-7 Beekman St.) Hand-book of information sent free to any address.



## TRADE NOTES.

**CHANDLER & TAYLOR**, builders of engines and saw mills, Indianapolis, Ind., make a specialty of Southern trade. Their illustrated catalogue for 1886 is out and will be sent to any address on application. This old established concern also make drain tile machinery, which is fully illustrated in their catalogue.

**THE Pennsylvania Saw Works**, 626 to 630 Grant street, Pittsburgh, Pa., have just issued a new catalogue and hand book, containing much valuable information to sawyers and saw mill owners. In it are full directions for gumming saws and how to restore burnt saws that have been through a fire by a new process. It will be sent free.

**THE Lumberman's Hand Book**, issued by J. W. Baldrige & Co., Cincinnati, Ohio, should be in the hands of every saw and planing mill owner. It will be sent free upon application.

**E. & B. HOLMES & Co.**, Buffalo, N. Y., inventors and manufacturers of stave, barrel, keg and hoghead machinery, have, during the past few weeks, made shipments of machinery to the following points:

Cincinnati, Ohio; Mobile, Ala.; St. Paul, Minn.; Appleton, Wis.; Chattanooga, Tenn. and Poughkeepsie, New York. This firm, beside manufacturing stave machinery, have one of the largest barrel factories in the world, and ship their product not only to all points in our country, but to South America and other foreign countries. They are pioneers in their line of business and very favorably known.

**TOTTEN & Co.**, of Pittsburgh, Pa., have the following rolling mill machinery under way: One universal mill for Brown, Bonnell & Co., of Youngstown, O., similar to the one built by them for Wilson, Walker & Co.; one universal mill for Everson, Hammond & Orr, Pittsburgh, Pa.; one 22" three-high nail plate train, especially adapted for rolling steel nail plate, for the new co-operative mill at Bellville, Ill.; one, same style, with improvements by Mr. Jno. B. Hastings, an experienced nail plate roller, of Ironton, O., for the Wellston Nail & Steel Co., of Wellston, O.; one 22" modern sheet train with 30-ton fly-wheel, for W. H. Everson & Co., of Scottdale, Pa.; one large size squeezer, special pattern, designed by Totten & Co., and which is taking the place of the old style squeezer, as it gives the ball more travel and more work, besides being adapted to larger balls; 12x24 Forster crusher and breaker for New York; 5x15 Forster crusher for mining, with general rolling mill orders for various parties.

ATTENTION is directed to the advertisement of McGinness, Smith & Co., heating and ventilating engineers and contractors, Pittsburgh, Pa. This well known concern manufacture steam and hot water heating and ventilating apparatus for public and private buildings, and are dealers in boilers, pumps, radiators, steam traps and pipe, valves, fittings, pressure regulators, etc., for steam, water and natural gas; also cooking and laundry machinery for hotels, public institutions and large private residences.

They come before the readers of the MANUFACTURERS' RECORD as practical, experienced engineers, who thoroughly understand their business. They are prepared to make estimates for the entire steam, water and gas fitting of buildings, large or small, anywhere in the South.

They have a large, fully illustrated catalogue, describing the various methods of heating and ventilating, that should be in the hands of every contractor and builder. It will be sent free upon application.

The Medart Patent Pulley Co., St. Louis, Mo., have issued a new catalogue of their wrought rim pulleys and other machinery for the transmission of power. It contains a good many interesting facts and some very strong letters, bearing on the merits of their pulleys.

**THE Troup factory**, of La Grange, Ga., decided some time ago, as noted in the MANUFACTURERS' RECORD, to put in new machinery for manufacturing white cottons. The entire order for machinery was given to the Lowell Machine Shop. This mill was formerly run on checks and colored cottons and all of the old machinery was thrown out and sold for old iron.

The plans for the mill were furnished by E. H. Owen, Jr., mill engineer, Lowell, Mass.

### Important.

The improvements of the Grand Union Hotel are simply elegant, and the hotel is always kept in perfect order. It is so convenient to all the depots that guests arriving by the Grand Central Depot have their baggage transferred to and from the Grand Union Hotel in five minutes, free of charge. Guests arriving by steamer or railroad, South, North, East or West, are conveyed to the Grand Union Hotel by the elevated railroad for five to fifteen cents, thereby saving \$3 carriage hire. During the past year 110,000 people occupied the 613 rooms of the Grand Union Hotel at \$1 and upwards per day, including of course its elegant suites of rooms for families on the European plan. The dining-rooms, restaurant, cafe, lunch and wine-rooms were supplied with the best at moderate prices. Families lived better at the Grand Union Hotel, and for less money, than at any other first-class hotel in New York.

**THE American House**, Boston, has always been noted for the invariable excellence of its table, and never more than at present. Mr. Rice well knows that it is quality rather than quantity that pleases the experienced guest.

T. M. Parker, Steel Stamps, Stencils, Hartford, Ct.

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For Cabinet, Chair, Carriage, Wagon, Carpenter, Millwright and Job Shops and Factories.

**GOOD WORK AND LOW PRICES.**

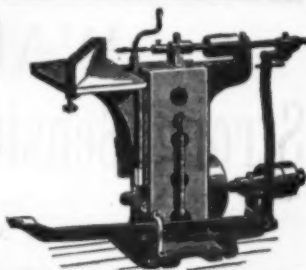
Before Purchasing Machinery write to

**F. H. CLEMENT,**

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ROCHESTER, N. Y.

Mention "The Manufacturers' Record."



## The Spiral Pug Mill

## QUAKER BRICK MACHINE.

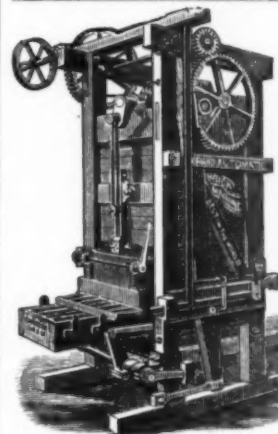
Capacity 40,000 Perfect Brick Per Day!

Great Saving in Labor and Expense!

We contract to furnish complete brick-yard outfit.—Engines and everything needed complete. Write for our hand-omely illustrated catalogue, containing valuable information. Estimates furnished. Correspondence solicited. Address

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## The GRAND AUTOMATIC Brick Machine.

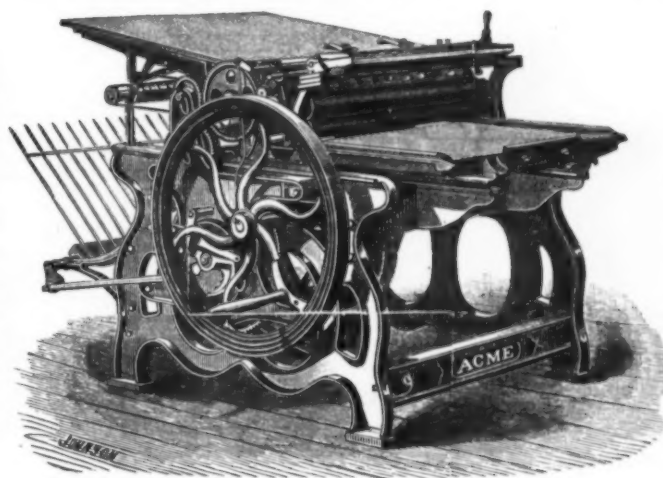
Well Tempered Brick are the Most Reliable.

The Grand Automatic makes the best tempered Brick in the world. It is the only Machine that makes better brick in every respect than can be made by hand. Send for catalogue to

**JONATHAN CREAGER,**  
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FOR NEWSPAPER OR JOB WORK.



FOR STEAM OR HAND POWER.

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The present hand-power Acme Presses fully equal, in capacity for fine work, the first-class two-roller Presses of other kinds, and they run much easier, and are also capable of higher speed by steam than any other Cylinder Press manufactured for country offices or for hand operation. The convenience of changing from newspaper to poster and job work is unequalled.

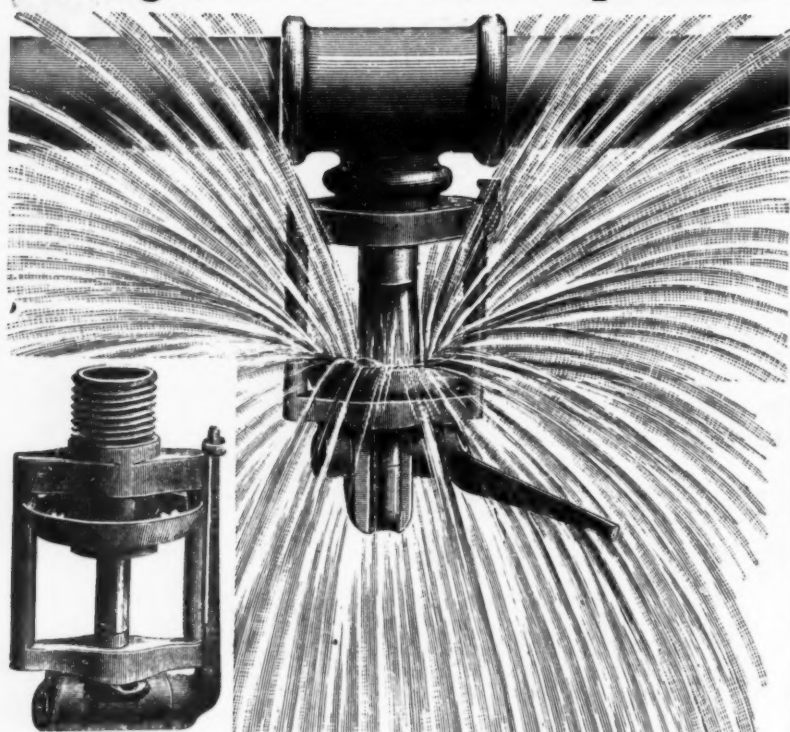
PRICES, - - \$900 to \$2,500.

Circulars, with sizes and prices, will be sent on application.

**C. C. CHILD, MANUFACTURER,**  
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## WALWORTH Strong Sensitive Link Sprinkler.



THE WALWORTH STRONG SENSITIVE LINK SPRINKLER, for the extinguishment of fires, having for its most salient points

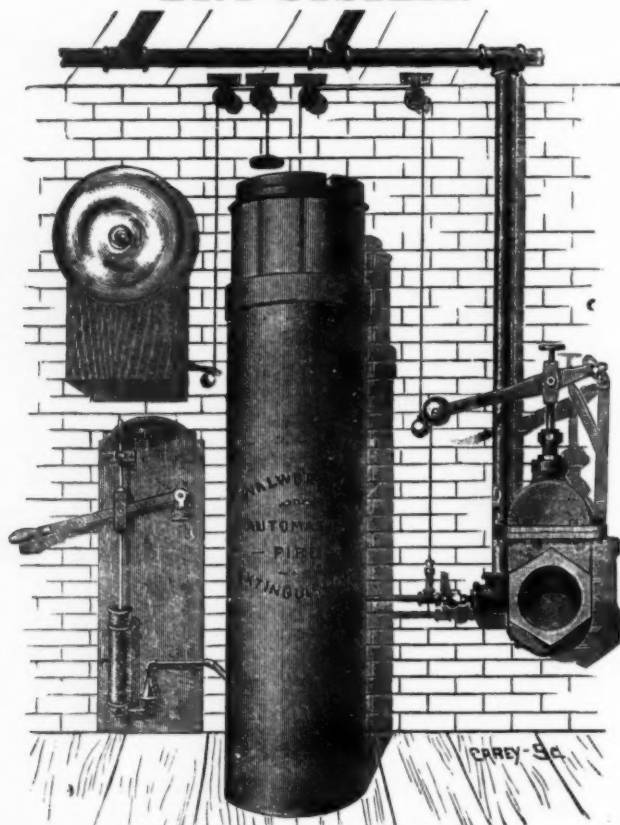
**STRENGTH, SIMPLICITY AND RELIABILITY,** has forced its way to the front solely because it has been proved to be the best Sprinkler made. No Sprinkler ever introduced has shown such good results. In no instance has it failed to act when needed, notwithstanding the fact that it has been severely tested in many instances.

*We give below the account of a remarkable fire:*

MESSRS. WALWORTH MANUFACTURING CO.:

GENTLEMEN—On Sunday evening fire was discovered in our engine room, and in five minutes had worked its way through a belt box to the fourth floor. For a few minutes it looked as if the place must go, but the automatic heads on each floor near the fire went off and quickly extinguished it without assistance from hose or anything else. Had there been sprinklers in the engine room, fire could not have got beyond it, and we will be pleased to have you put them in this room at your earliest convenience. After the fire was out we shut the water off at tanks, put on new rings at the eleven heads which had gone off, and with water on started in full next morning as though nothing unusual had taken place.

## WALWORTH Automatic FIRE Extinguisher. DRY SYSTEM.



By this system the pipes are filled with compressed air under a pressure of one pound to the square inch. Attached to the pipes is an Airometer, the inner tank having a weight upon it of 100 pounds. This tank and weight is raised by the compressed air, and as soon as a Sprinkler is opened the pressure, being released, allows the tank and weight to fall, thus opening a valve and either starting the pump or releasing the water from tank or street mains. It is so arranged that an alarm will sound just before the valve is to be opened, notifying that there is a fire, or that more air must be pumped. The entire supply of air can be produced by a few strokes of the air pump. Manufactured by the

## Walworth Manufacturing Co.

No. 16 Oliver Street, BOSTON.

## The Manufacturers' Record,

A WEEKLY PAPER,

Devoted to the Industrial Interests of the Southern States, having for its aim the Upbuilding of Southern Manufactures, and the Development of the Material Resources of the South.

Manufacturers' Record Co., Publishers, Baltimore.

Below are a few extracts from recent issues of Southern papers, showing the estimation in which the MANUFACTURERS' RECORD is held by those best capable of judging of the value of its work:

THE BALTIMORE MANUFACTURERS' RECORD has been doing a valuable work for the South in making a specialty of reporting Southern progress. No paper in the Union has more entitled itself to Southern gratitude than this enterprising and reliable journal. The RECORD has come to be a standard of authority in the matter of Southern advancement. Its labor has been remarkable in this work, and its care and accuracy phenomenal. No journal has done more to bring Southern resources to Northern observation. Let our Southern press uphold the RECORD in its good labor. It has conferred an incalculable benefit upon our section.—*Chronicle and Constitutionalist*, Augusta, Ga.

OUR leading manufacturing organ of the South.—*Beaumont (Tex.) Enterprise*.

THE BALTIMORE MANUFACTURERS' RECORD is almost a real necessity to every live Southern manufacturer and would prove of value to every intelligent Southern man. It is devoted exclusively to the industrial development of the South, but is the most complete and reliable paper of the kind published anywhere. It is the only technical journal of which we know that, without being what is known by the stereotyped adjective "popular," is of real interest to the general reader.—*Shelby, N. C., New Era*.

Is accomplishing a work of inestimable value to our section of the country. There is no other journal in the country which contains so much valuable and thoroughly reliable information about the South. It has thrown itself heart and soul into the great and good work in which it is engaged, and has been a powerful factor in inaugurating and helping forward the march of Southern progress.—*Farmville (Va.) Journal*.

No journal published in this country that shows more real interest in the development of the South in all its industries. It is always welcomed in our sanctum as the champion of Southern enterprise, and we find it is extensively quoted and more highly commended by the Southern press than any other trade paper in the Union.—*Citizen*, Canton, Miss.

PUBLISHES every week probably more information relative to Southern manufacturing, mining and railroad affairs than can be gathered from any other single source. It has in many ways contributed largely to the material development of the South, and deserves a wide circulation throughout the Southern States.—*News and Courier*, Charleston, S. C.

Its editors have discernment enough to see that there is a bigger boom in store for this section than has yet been forecast, and it has labored zealously in aiding to unfold its resources.—*Daily Review*, Wilmington, N. C.

A WELL got up, lively and enterprising journal like the MANUFACTURERS' RECORD is just the right thing in the right place. No manufacturer, business man, or, in fact, anyone interested in the progress of the South, should be without it.—*The Commercial*, Newport News.

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ONE of the most interesting and useful journals that come to our table. It is the best source of information in regard to the progress of the industries of the South that we have in the country.—*Natches (Miss.) Democrat*.

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Is doing a wonderful work for the South.—*Owensboro (Ky.) Messenger*.

THE leading journal of its class in this country.—*Elkton (Md.) Whig*.

THE BALTIMORE MANUFACTURERS' RECORD is one of the ablest industrial journals in the country.—*Atlanta (Ga.) Constitution*.

ONE of the best papers published in the United States for the accomplishment of the purpose to which it is devoted. It has done more to build up railroads, manufacturing and mining interests in the Southern States than all other instrumentalities combined, and deserves and should receive the liberal support of the Southern people. It is ably edited, valuable for its exhaustive statistical record of Southern industries and enterprises, finely printed and illustrated, and is worth ten times its subscription price to every mechanic, merchant and manufacturer in the Southern States. It has a large corps of able and painstaking contributors in the Southern States, and gathers up all the material facts. We find it invaluable in giving us much useful information about the South, of which we would know nothing without the MANUFACTURERS' RECORD.—*Commercial*, Pensacola, Fla.

THE MANUFACTURERS' RECORD may be compared to a smooth and polished mirror, in which Southern prosperity is fully and faithfully reflected. It is abundantly worthy of the signal success which has marked every stage of its career, and we rejoice that it exhibits yet greater indications of future growth and prosperity.—*The Sunny South*, Atlanta, Ga.

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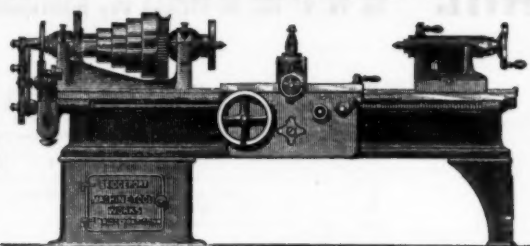
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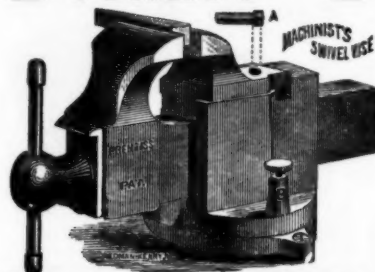
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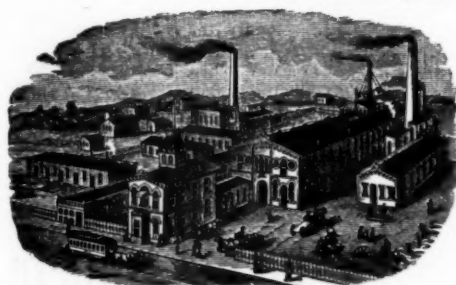
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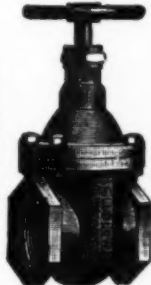
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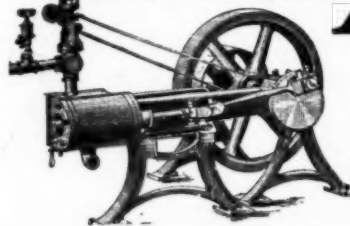


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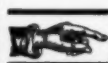
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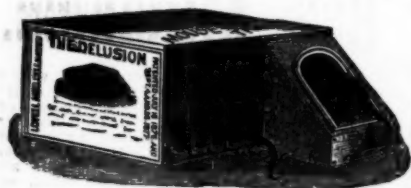
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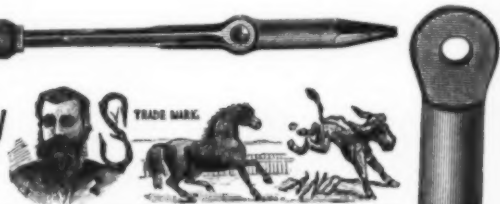
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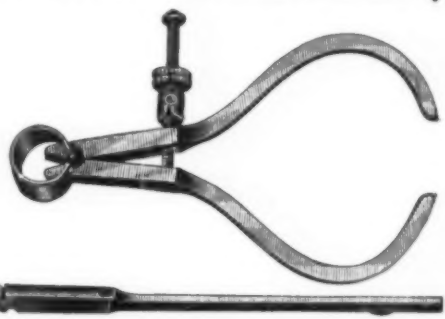
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The Holyoke Machine Company, of Worcester, Massachusetts, advertise in this issue their well-known Hercules Water Wheel. This wheel has many points of merit that strongly commend it to the attention of those who use water power. The most thorough tests have demonstrated its many good qualities. In Holyoke it is the standard water wheel, the aggregate horse power of the Hercules wheels in operation there being greater than that of all other wheels combined. These wheels are very popular in the South as well as in the North, having been in use for many years in a large number of Southern mills. There are four of the Hercules wheels now in operation in the big cotton mills of the Eagle & Phenix Manufacturing Co., Columbus, Ga., and Mr. John Hill, of that company, in writing, Feb. 25, 1885, to the Holyoke Machine Co., said: "Within the past four years I have ordered four 'Hercules' wheels, all of which have given the purchasers entire satisfaction. Three of the wheels are on regular duty in the Eagle & Phenix Mills. The first wheel ordered did so well that a 'Hercules' wheel has been added each time a new wheel was wanted. In the Eagle & Phenix Mills I supervise twenty water wheels of six different styles. The 'Hercules' is by far the most durable and best made wheel in use here, and, in fact, I know of no wheel its equal mechanically. It is all that can be desired in economy of water. In fact, it is a strictly first-class wheel in every way, and the wheel to buy, use and depend upon."

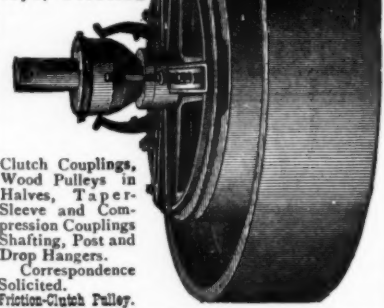
That is a pretty strong letter, but it is only a sample of letters received by the manufacturers of this wheel. Among the recent shipment of wheels have been two—one a 34-inch and one of 60-inch—to a Georgia cotton mill. Two Hercules wheels are being put in at Natick Cotton Mill, and one at the Arctic Mill of B. E. & R. Knight near Providence. This will make eleven wheels furnished to this well-known firm, one of the most prominent in the manufacturing line in New England. Hercules wheels are sold in England, Ireland and Scotland, and on the Continent, a cable order having been received only a few days ago for one to go to France. The manufacturers say: "The Hercules gives the most power for its size and the highest average percentage from full to one-half gate of any wheel ever made." Their advice to all users of water wheels is to "get the best at first." If you are interested in water wheels, if you want a new wheel or a larger wheel, or a better wheel than you are using, write to the Holyoke Machine Co., Worcester, Mass., for catalogue No. 3.

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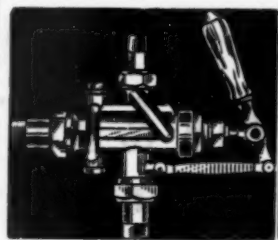
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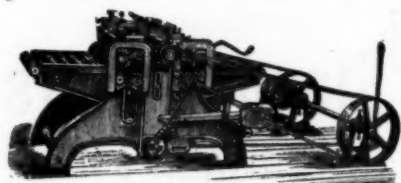
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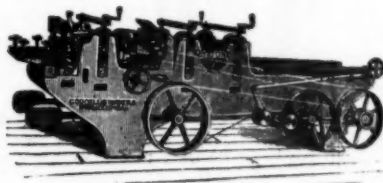
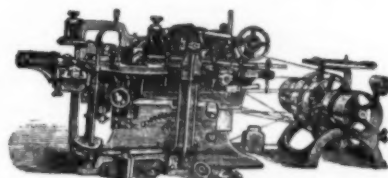
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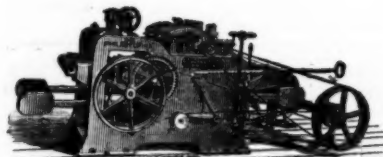
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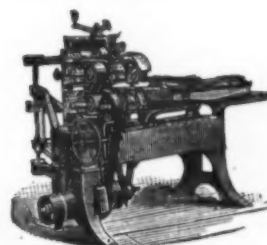
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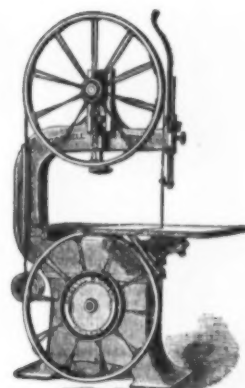


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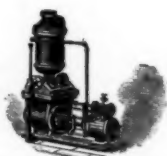
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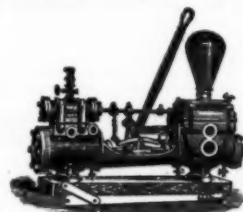
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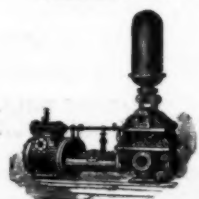
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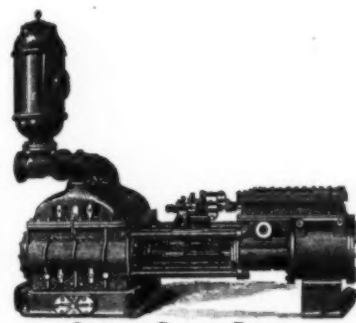


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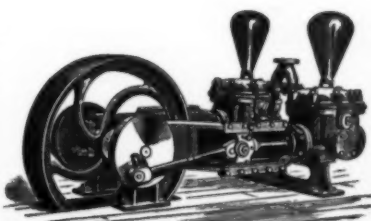


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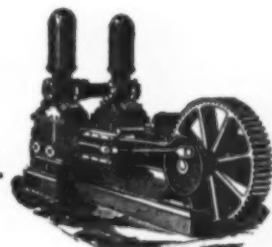


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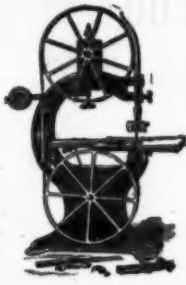
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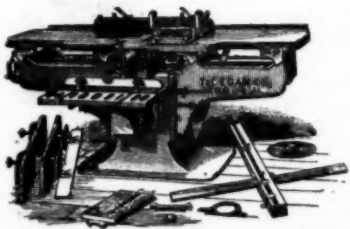
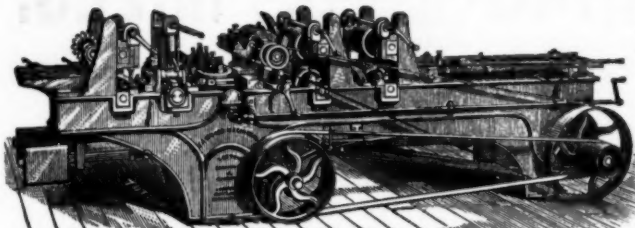
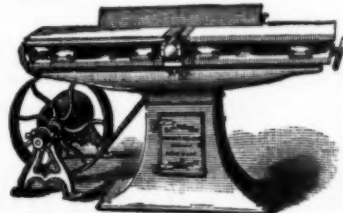
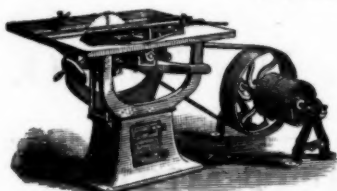
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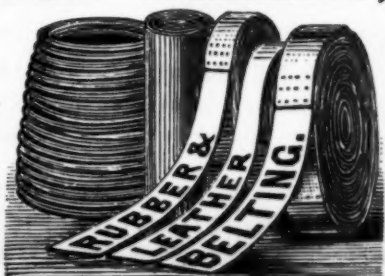
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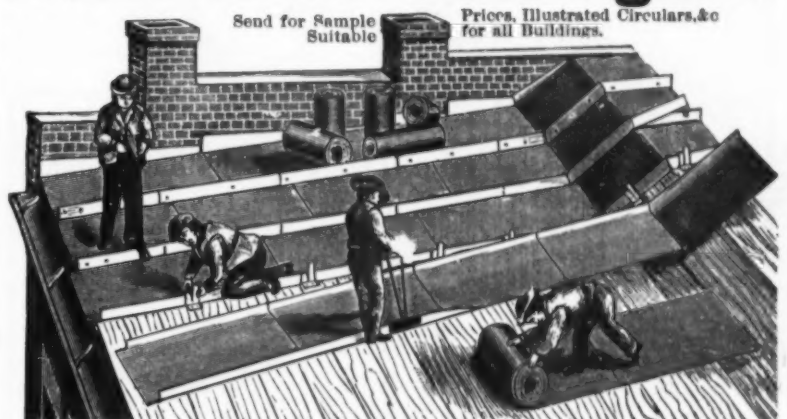
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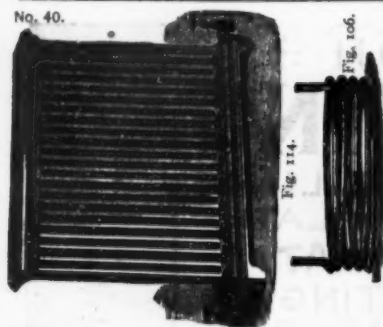


Fig. 106.

Fig. 114.

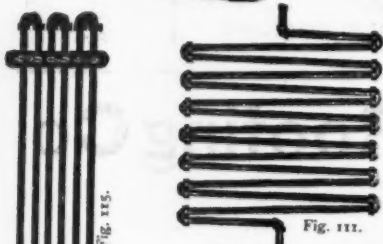


Fig. 115.

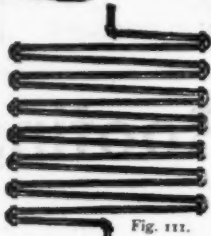


Fig. 117.

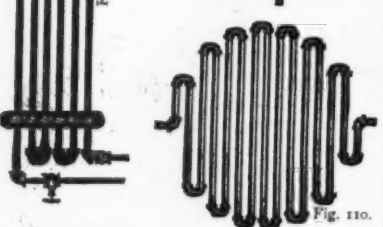


Fig. 110.

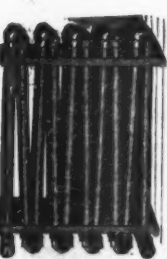


Fig. 118.

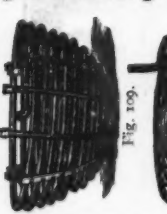


Fig. 109.



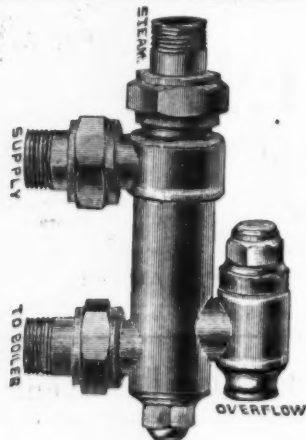
Fig. 105.

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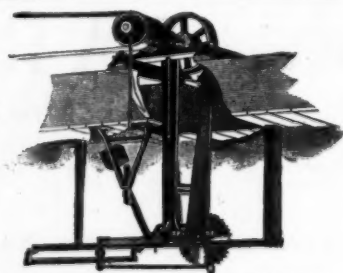
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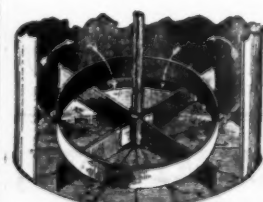
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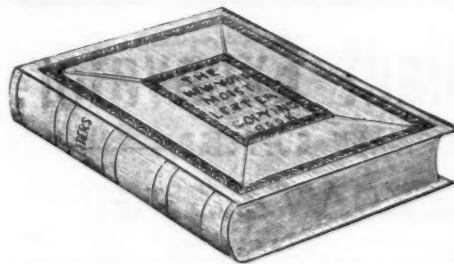
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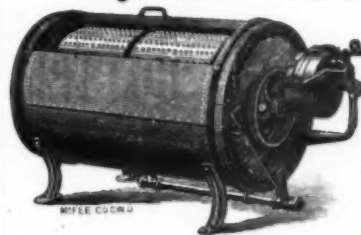
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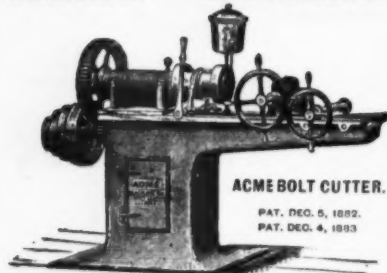
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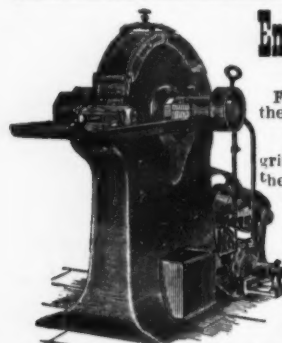


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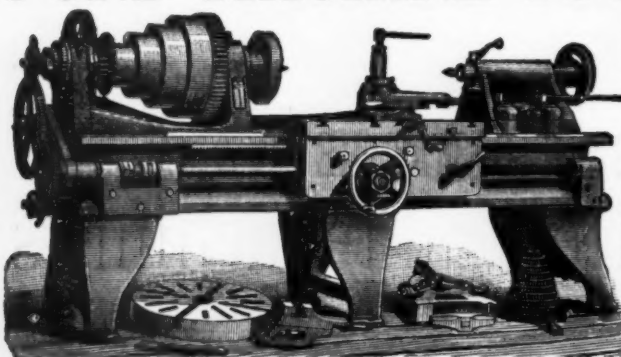
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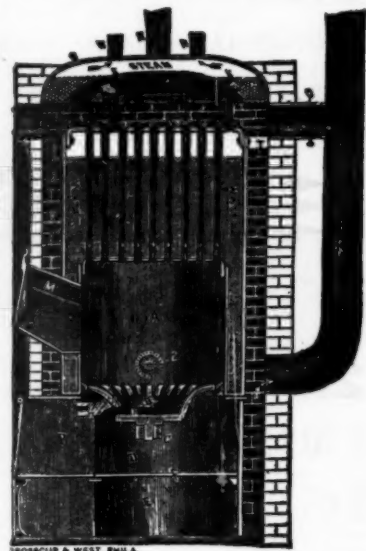
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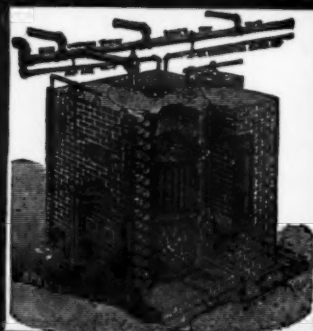


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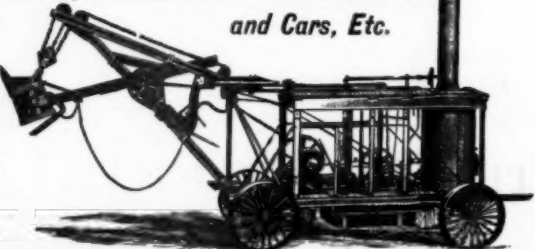
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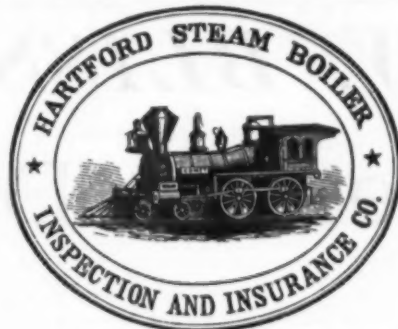
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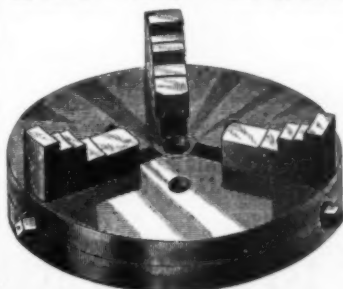
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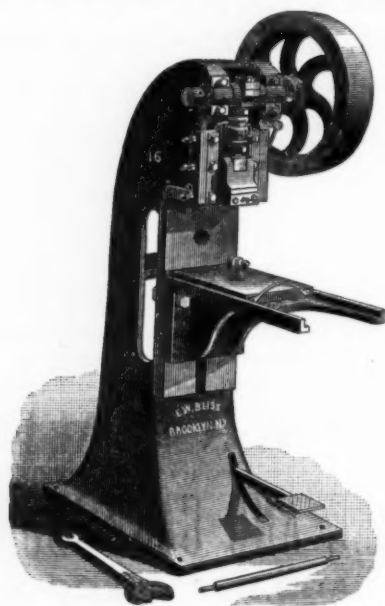
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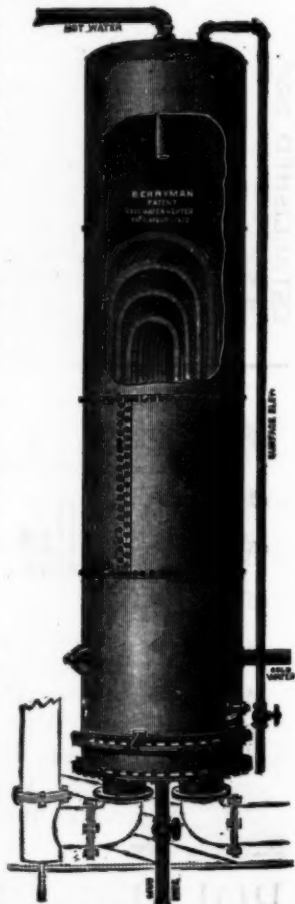
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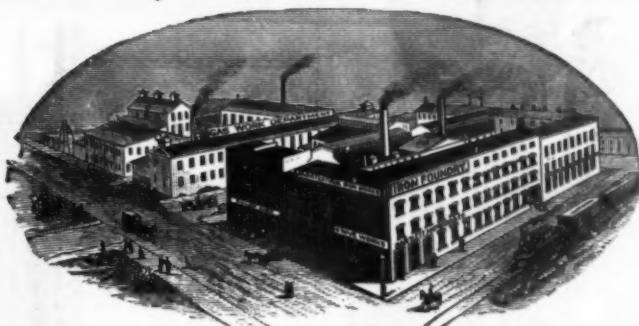




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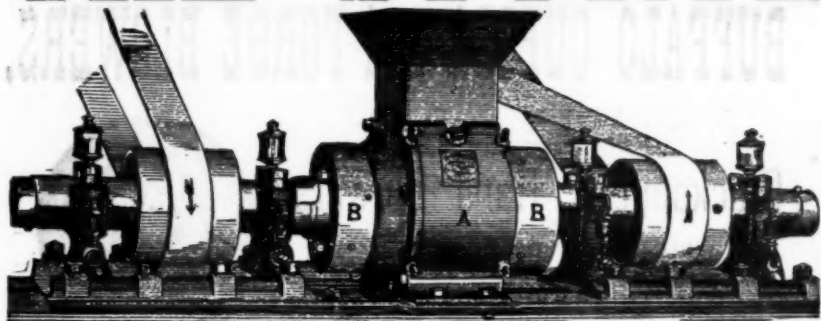
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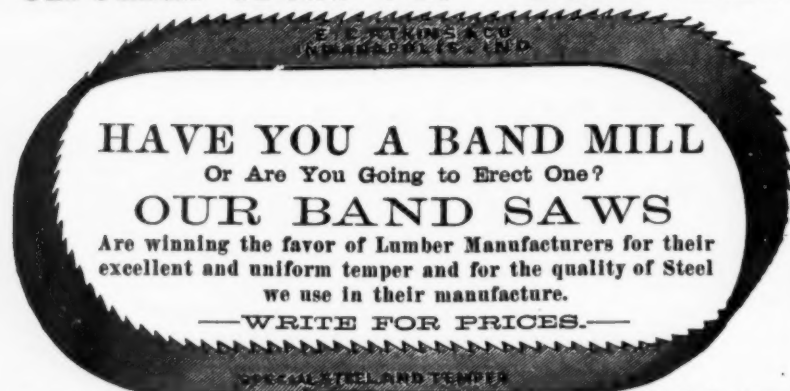
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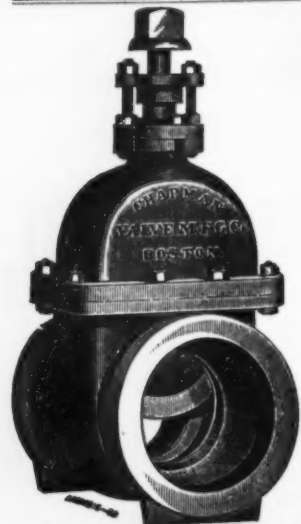
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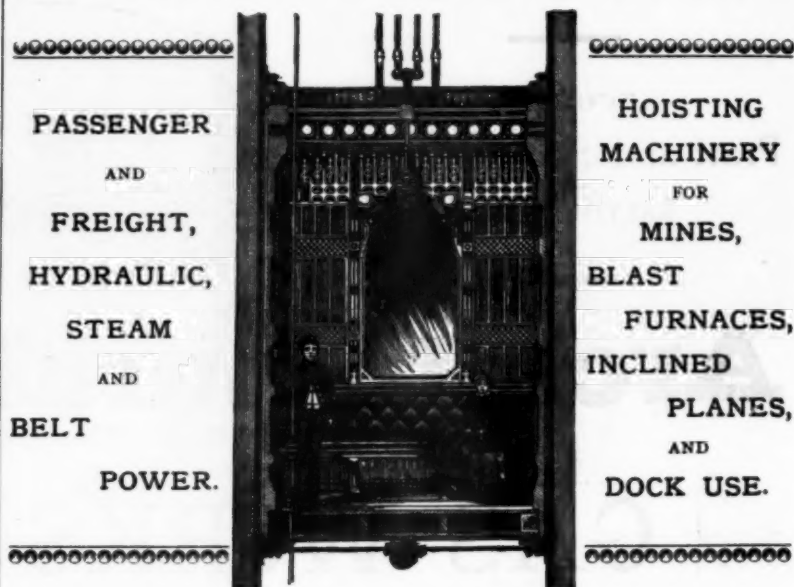
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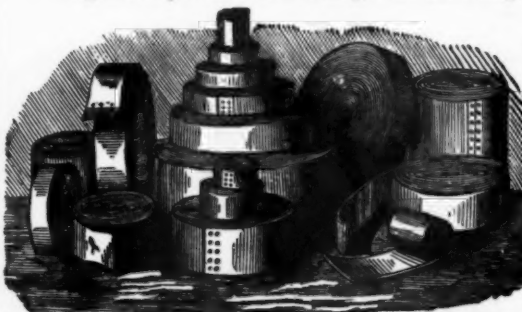
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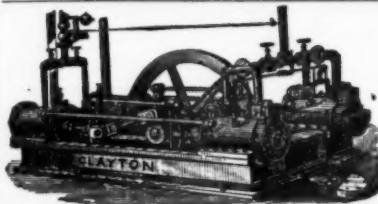
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